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In the Supreme Court of the United States

OCTOBER TERM, 1977

JAMES R. CRICCHI,

Petitioner,

vs.

CHARLES T. NABER and GEORGE C. LOCKWOOD,

Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

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James R. Cricchi respectfully petitions for a writ of certiorari to review the judgment of the United States Court of Customs and Patent Appeals* in the above-entitled case.

OPINIONS BELOW

The opinion of the CCPA (App. 1a-10a)** is reported at 567 F.2d 382, 196 USPQ 294 (1977.) The opinions of the

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* Hereinafter usually referred to as "CCPA".

** "App." as used in this petition refers to the Appendix presented with this petition.

Board of Patent Interferences* (App. 10a-26a) are unreported.

JURISDICTION

The CCPA judgment was entered on December 22, 1977. The CCPA denied Cricchi's petition for reconsideration on February 23, 1978. The jurisdiction of this Court is invoked under 28 USC 1256.

STATUTES INVOLVED

35 USC § 102

Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless—

• • •

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

35 USC § 141

Appeal to Court of Customs and Patent Appeals

An applicant dissatisfied with the decision of the Board of Appeals may appeal to the United States Court of Customs and Patent Appeals, thereby waiving his right to proceed under section 145 of this title. A party to an interference dissatisfied with the decision of the board of patent interferences on the question of priority may appeal to the United States Court of Customs and Patent Appeals, but such appeal shall be dismissed if any adverse party to such interference,

* Hereinafter usually referred to as the "Board".

within twenty days after the appellant has filed notice of appeal according to section 142 of this title, files notice with the Commissioner that he elects to have all further proceedings conducted as provided in section 146 of this title. Thereupon the appellant shall have thirty days thereafter within which to file a civil action under section 146, in default of which the decision appealed from shall govern the further proceedings in the case.

35 USC § 144

Decision on appeal

The United States Court of Customs and Patent Appeals, on petition, shall hear and determine such appeal on the evidence produced before the Patent and Trademark Office, and the decision shall be confined to the points set forth in the reasons of appeal. Upon its determination the court shall return to the Commissioner a certificate of its proceedings and decision, which shall be entered of record in the Patent and Trademark Office and govern the further proceedings in the case.

QUESTIONS PRESENTED

1. Is the "reasonable diligence" requirement of 35 USC 102(g) met for a time period during which the first inventor and his associates work on improving a fabricating technique which they in good faith regarded as required for the manufacture of a satisfactory device embodying the invention?

2. Under 35 USC 141 a "party . . . dissatisfied with the decision of the Board of Patent Interferences may appeal to the United States Court of Customs and Patent Appeals . . . ." Under 35 USC 144 the CCPA "shall hear and determine such appeal on the evidence produced before the Patent and Trademark Office . . . ." Under these provisions is the standard of review determined in each individual case by the CCPA's discretion or is the CCPA bound

to follow the customary standards of judicial review to which it had subscribed in its own precedents?

STATEMENT

The proceedings from which this petition arises were conducted to determine which of the parties is entitled to a patent for a new and improved transistor.

The development of transistors and associated solid-state technology has resulted in the application of electronics to more and more aspects of our everyday life. In the field of radio and television transistors, due to their small weight, size and power consumption, and their reliability and durability, have almost completely displaced vacuum tubes. With the evolution of the integrated circuit, in which hundreds of transistors may be simultaneously fabricated in a tiny wafer of silicon, the use and application of transistors is increasing even more rapidly.

Led by American business and research institutions, large and small enterprises in the major industrial countries are straining to advance the frontiers of the art of microelectronics and integrated circuits. The Ministry of Technology of the Federal Republic of Germany reportedly "considers microelectronics the most important frontier of all . . ." Williamson, "Siemens Starts Second but Finishes First," Fortune, Apr. 10, 1978, pp. 58, 68.

One field in which transistors were not used extensively is the storage of digital data for use with computers. This function was conventionally performed by magnetic core memories which are disadvantageous because they are relatively bulky, difficult to fabricate and consume substantial power (TR 1149).*

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* "TR" as used in this petition refers to the printed Transcript of Record in the CCPA.

The invention relates to a type of transistor made of layers of metal, silcon nitride and silicon dioxide on a semiconductor base or substrate, usually referred to as an MNOS device. This type of transistor has the capacity to store positive or negative electrical charges in response to a voltage pulse representing a data bit. The charges tunnel through the thin oxide layer of the device and are trapped at the nitride-oxide layer interface. The trapped charges constitute the "memory" of the device and the injection of the charges is referred to as "writing" into the memory. The stored charge is retained even when electrical power is not supplied to the device. The MNOS device thus has a "nonvolatile" memory.

To store digital data large numbers of these memory transistors can be used in a so-called memory "matrix" or memory "array." These memory arrays are particularly useful in computers which typically require the storage of large amounts of data. A data bit stored in the memory transistor can be repeatedly read from the memory without erasing the stored bit, this characteristic being referred to as "nondestructive readout."

Transistors which preceded the MNOS memory transistor found only limited use as memory elements for computers because they lacked nonvolatile memories and because two transistors were required to store a single bit of data. MNOS memory transistors overcome these disadvantages and are likely to supersede the magnetic core memories now in widespread use because MNOS memory transistor arrays require less power to operate and are smaller and easier to fabricate than magnetic core memories (TR 1149).

The present invention is directed to the solution of problems which "must be overcome before state-of-the-art MNOS devices can become practical" (TR 201). Cricchi

conceived of his invention in connection with a proposal dated October 22, 1969, which Westinghouse made to the Air Force Avionics Laboratory (TR 891-994). Westinghouse proposed a 1-year exploratory development "to achieve the necessary technology base for designing and fabricating discrete devices and arrays of silicon nitride variable threshold* transistors suitable for digital storage" (TR 949). The proposal was for memory arrays having fast read/write characteristics (approximately 1,000 times faster than prior Westinghouse MNOS devices) and designed so that the threshold would not change appreciably under continual read/write cycling (TR 949). To accomplish these objectives devices having a very thin oxide film were required (TR 950).

Naber and his co-inventors** thought of the invention in June of 1970, i.e., about seven months later than Cricchi. Naber filed a patent application on December 3, 1970 and received the patent on March 6, 1973 (TR 195).

Cricchi's patent application was filed on January 20, 1972 as Serial No. 219,463 (TR 11). On April 18, 1973 the Patent Examiner required Cricchi to amend his application by adding thereto claim 10 and other claims of the Naber patent which find support in Cricchi's patent application (TR 49, 50). An interference was officially declared on May 31, 1974 (TR 876) to determine the "question of priority of invention . . ." (35 USC 135(a)). In support of their respective claims to priority, both parties introduced documentary evidence and the testimony of the inventors and their collaborators.

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* The term "variable threshold" refers to the above-described storage of positive or negative charges at the oxide-nitride interface when writing into memory.

** Hereinafter collectively referred to as "Naber".

The date of satisfactory physical completion of Cricchi's invention was a matter of dispute. The earliest tests which the Board found to be independently corroborated were conducted on September 28, 1971. That date was consequently regarded as Cricchi's date of actual reduction to practice (App. 18a).

The principal question on which the award of priority depended in the opinions of the lower tribunals is whether Cricchi and his collaborators had "reasonable diligence" from June 1970 to September 28, 1971 as required by 35 USC 102(g). Cricchi had the burden of proving his priority by a preponderance of the evidence (App. 13a).

Cricchi relied on evidence tending to show that from June 1970 to October 1970 Westinghouse worked to improve the technique of depositing the various layers of silicon dioxide and silicon nitride comprising the MNOS device, and that such work was considered necessary for a commercially satisfactory reduction to practice.

Cricchi's evidence relating to activities during the October 1970 to September 1971 period includes his own testimony, the testimony of seven of his co-workers, a large number of contemporaneous documents and several physical exhibits of which CX III-1* and CX III-2 are particularly important.

The Board held that Cricchi had been diligent during both segments of the diligence period, i.e., from June 1970 to October 1970 and from October 1970 to September 28, 1971. The Board also noted in its opinion of June 28, 1976 (App. 22a) that Naber's brief at final hearing before the Board did not question that Cricchi's activities between October 1970 and September 1971 met the statutory re-

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* "CX" as used in this petition refers to Cricchi exhibits in evidence.

quirement of "reasonable diligence". That issue was raised more than one month after the Board's decision in Naber's request for reconsideration (TR 1104-1109). The Board denied this request (App. 24a-26a).

Upon appeal to the CCPA the Board was reversed and priority of invention was awarded to Naber. The CCPA held that Cricchi did not have reasonable diligence during either segment of the critical time period. Cricchi petitioned for rehearing on the grounds that:

(1) the CCPA's holding concerning the June to October 1970 period was legally erroneous and in conflict with *Bell Telephone Labs.* v. *Hughes Aircraft Co.*, 422 F.Supp. 372 (D. Del. 1976) (App. 31a-51a)* and

(2) there was massive and well-corroborated evidence of diligence covering the period from October 1970 to September 1971.

On February 23, 1978 the CCPA denied Cricchi's petition for rehearing without opinion.

* Affirmed, 564 F.2d 654 (3rd Cir. 1977), (App. 27a-31a), cert. denied, 197 USPQ 448 (March 20, 1978).

REASONS FOR GRANTING THE WRIT

I. SUMMARY

Question 1. The Constitution in Article 1, Section 8, and the Patent Statute intend to stimulate the progress of the useful arts by rewarding the first inventor. The decision below in effect withholds the reward from the inventor who first had the clear and concrete idea of the invention and who endeavored in good faith to embody his inventive idea in a useful structure.

According to the decision below the first inventor's right to patent protection is forfeited to a later inventor, unless the first inventor immediately embodies his invention in a laboratory device which he does not regard as useful or satisfactory for the intended purpose. The CCPA's holding in this respect conflicts sharply with the law of other federal courts of appeals.

Question 2. The Board ruled that Cricchi's evidence constituted a corroborated showing of reasonable diligence during the period from October 1970 to September 1971. The CCPA's reversal of this ruling is not based on any error of law in the Board's decision and ignores extensive and well-corroborated evidence of diligence. If 35 USC 141 confines the CCPA to the accepted and usual standards of judicial review, the Board's holding could not have been reversed without a thorough review of the record and a reasoned conclusion that the ultimate fact found by the Board was against the manifest weight of the evidence.

The proper administration of justice is jeopardized if a tribunal whose own precedents establish its role as narrowly appellate is at liberty to depart from that role and

act as an unreviewable finder of ultimate fact. The standard of review inherent in 35 USC 141 has not been defined by this Court or by statute. Unpredictable vacillations concerning the standard of CCPA review are likely to continue, unless this Court defines that standard.

II. An Inventor Who Works in Good Faith to Embody His Invention in a Useful Physical Device Rather than a Laboratory Curiosity Meets the Statutory Requirement of Reasonable Diligence.

a) The Evidence Pertinent to the First Time Segment, June to October 1970.

Westinghouse had started its work on improving layer deposition techniques for MNOS devices before October 1969 and continued such work long after the present invention had been reduced to practice. As stated by NCR's Dr. Kendall, work of this nature was required to obtain "reliably and consistently" . . . "good nitride layers, good oxide layers" and to get "nitride layers of the right electrical conductivity" (TR 819). At Westinghouse these problems with the layer deposition technique had not been solved when Cricchi conceived the invention and admittedly remained unsolved "right up to the end of 1969." To build MNOS devices that would last for more than "a few hours" Naber's assignee, NCR, had spent "a year in preliminary research" of the same kind before June of 1970 (TR 818-820).

Dr. Corak, the Manager of Solid State Technology of the Westinghouse Systems Development Division, as well as Cricchi testified that a device embodying the "basic idea" conceived by Cricchi could have been built within three to six months (TR 306, 342). However, the layer deposition work at Westinghouse was considered necessary

"in order to make a feasible device--feasible in terms of having a device other than a laboratory curiosity" (TR 358). Cricchi considered the work on layer deposition techniques necessary because "we operate in an environment where the fundamental characteristics were of primary importance" (TR 306). The inventor and his collaborators (TR 275):

> "were not satisfied with . . . [their] fundamental understanding of the nitride-oxide structures required, both the nitride thick oxide, and the nitride thin oxide structure required to build the 1969 structure [i.e., the invention]."

The Board agreed with Dr. Corak and Cricchi that the work done at Westinghouse during the June to October 1970 period was "required in order to reduce to practice the transistor conceived by Cricchi on October 22, 1969" and constituted "reasonable diligence" (App. 23a). The Board denied Naber's petition for reconsideration of the quoted holding, saying:

> ". . . even though the device at issue possibly could have been built without the additional work on layer formation, the technology had not been developed at Westinghouse to the point where such devices could have been constructed with the expectation that they would exhibit *the necessary properties and characteristics required* of memory devices" (App. 25a). (Emphasis added).

The CCPA reversed and held with respect to this issue that work "directed at improving oxide and nitride layer deposition techniques generally applicable to all MNOS devices did not satisfy the requirement of 'reasonable diligence' on the part of Cricchi" (App. 7a).

The CCPA noted that work on improving layer deposition technique had commenced at Westinghouse before the date of Cricchi's inventive concept and had continued after

the invention was reduced to practice. The CCPA said that treating this layer deposition work as "reasonable diligence" for the June to October 1970 period would "grant Cricchi a reservoir of 'reasonable diligence'" and would defeat the public "policy [which] favors the early disclosure of inventions" (App. 7a). The CCPA emphasized that the layer deposition work during June to October of 1970 would not qualify as "reasonable diligence" because it was "needed to produce a commercially acceptable device. . . ." (App. 7a).

The CCPA opinion does not expressly place upon the first inventor "an absolute obligation to choose the simplest device embodying the structure of the counts to attempt a reduction to practice" (App. 6a, note 3). However, the opinion gives the first inventor no reasonable leeway in this regard. It holds legally insufficient the inventor's efforts directed toward the development of a technique which he considers a "necessary, preliminary" (TR 226) "essential, fundamental step" (TR 227) to the construction of a useful device rather than a mere laboratory device (App. 5a-7a). The CCPA apparently believed that its present holding was little more than an application of its own precedents. Petitioner submits that the present holding goes far beyond the precedents cited by the CCPA and conflicts with at least some CCPA decisions, *Clancy* v. *De Jahn*, 36 F.2d 131 (CCPA 1929), *Watkins* v. *Wakefield*, 443 F.2d 1207, 1209, 1210 (CCPA 1971) and *Reinhart* v. *Coursen*, 458 F.2d 516 (CCPA 1972).

b) The CCPA's holding has no Support in the Statute, Conflicts with Precedents of the Courts of Appeals and Confuses the Reasonable Diligence Standard.

35 USC 102(g) speaks of "reasonable diligence" without mentioning the object of such diligence. However, it

is well accepted that the object must be the same as that referred to in predecessor statutes, namely, "diligence in adapting and perfecting the [invention] . . ." Federico, "Commentary on the New Patent Act," 35 USCA pp. 55, 56. The statute lacks any indication that efforts to perfect the invention should not be counted as reasonable diligence or that the inventor has no reasonable discretion in selecting the path to be followed in adapting and perfecting the invention.

The most recent example of the correct application of 35 USC 102(g) to a similar situation is *Bell Telephone Labs.* v. *Hughes Aircraft Co.* (App. 27a-31a), *affirming*, (App. 31a-51a), cert. denied, 197 USPQ 448 (March 20, 1978). The *Bell* case turned on the question of reasonable diligence in reducing to practice an invention relating to a "silicon gate field effect transistor" (App. 27a) which must be fabricated in essentially the same manner as Cricchi's MNOS device. The Third Circuit held (App. 29a):

> "It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered. But whether particular work is sufficiently connected with the invention to be considered to be in the area of reducing it to practice must be determined in the light of the particular circumstances of the case which may be as varied as the mind of man can conceive. It is thus peculiarly a question of fact . . . ." (Footnote omitted)

In the *Bell* case the district court had found diligence and priority of invention in favor of an inventor who had spent much time on experimentation "directed to solving . . . a problem which in itself would not have precluded a successful reduction to practice" (App. 46a). According to the *Bell* case (App. 50a, note 19):

> ". . . work on problems inhibiting *commercial utilization* of the process should be deemed reasonable diligence, whether that work encompasses the whole of the process, one step in the process, or an ultimately abandoned step." (Emphasis added)

The CCPA in the present case ruled that work directed to a "commercially-acceptable device" does not constitute diligence (App. 7a).

These views are in irreconcilable conflict. Grave injustice to the parties is likely to result from the conflict between the CCPA and the Third Circuit. The claims which the CCPA decision awarded to Naber will be held invalid in the Third Circuit upon the same evidence of Cricchi's prior invention which was before the Board and the CCPA. Thus, the principal benefit of the CCPA decision does not accrue to either the first or the second inventor but to an infringer who selects the Third Circuit to litigate the validity of the Naber patent.

The Court of Appeals for the District of Columbia subscribes to a rule diametrically opposed to that adopted in the present case, *Woods* v. *Poor*, 29 App. D.C. 397 (1908), *Kitchen* v. *Smith*, 39 App. D.C. 500, 502 (1913) and *Sargent* v. *Vetter*, 48 App. D.C. 582 (1919). The *Kitchen* case holds:

> "that an inventor is rather to be commended than blamed for attempting to make his invention as complete and practical as possible before applying for a patent instead of entering the office with it in a crude and incomplete state—see *Griffin* v. *Swenson*, 15 App. D. C. 135-142; and cases there cited . . . ."

According to the *Sargent* case, an inventor who spends eight months endeavoring to start commercial manufacture of the invention does not lack diligence even though it "would have cost but a few dollars to have had a device embodying the invention made . . . ." The District of

Columbia has consistently adhered to its version of the reasonable diligence rule as illustrated in an opinion by Justice Rutledge shortly before his elevation to this Court, *Abbott* v. *Shepherd*, 135 F.2d 769, 770 (D.C. App. 1942):

> "In view of his priority in conception, Abbott is entitled to priority in invention if he reduced it to practice prior to March 19, 1934, or if he maintained due diligence *in perfecting it until the time of his application.*[2]
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> [2] Cf. Woods v. Poor (1), 1907, 29 App. D.C. 397; Kitchen v. Smith, 1913, 39 App.D.C. 500; Saurer v. Groebli, 1916, 45 App.D.C. 298; Dickinson v. Swinehart, 1920, 49 App.D.C. 222, 263 F. 474; Gammeter v. Backdahl, 1920, 50 App.D.C. 45, 267 F. 347; Joy v. Morgan, 1924, 54 App.D.C. 110, 295 F. 931." (Emphasis added)

The conflict between the rule announced by the CCPA in the present case and the consistent judicature of the Court of Appeals for the District of Columbia and the Third Circuit create a severe conflict. Resolution of this conflict is particularly imperative because review of priority awards made by the Board of Patent Interferences is bifurcated under 35 USC 141. An inventor who loses an interference because the Board adopted the CCPA's narrow rule of reasonable diligence will maneuver for review in the Third Circuit or the District of Columbia. Conversely, the Board's application of the more liberal rule followed in the Third Circuit and the District of Columbia will cause the loser to seek review in the CCPA. The frequency of appeals is likely to increase since the Board cannot preselect its ratio decidendi to conform to the rule accepted in the eventual court of review.

The existence and importance of the conflict cannot be obscured by subsidiary reasons given by the CCPA for its rule that efforts toward creating commercial utility cannot be reasonable diligence.

The CCPA decision (App. 6a) cites *Goodrich* v. *Harmsen*, 442 F.2d 377, 383, 58 CCPA 1144 (CCPA 1971). That case merely exemplifies the well-established rule that an actual reduction to practice can occur before the invention is ready for commercial production. The rule of the *Goodrich* case need not be repudiated to accept the standard of reasonable diligence adopted in the Third Circuit and the District of Columbia. The rule of the *Goodrich* case bears no logical or policy relation to a rule which equates efforts to bring the invention closer to commercial acceptability with lack of reasonable diligence.

Nor can the CCPA's restrictive standard of reasonable diligence be supported by reference to the policy favoring "the early disclosure of inventions" (App. 6a, note 5, 7a). That policy is not the only lodestar of the patent law. Rather the scope and function of the early disclosure policy is statutorily circumscribed by the one-year preclusion period of 35 USC 135(b)* and the clause of 35 USC 102(g) which denies patents to inventors who "had abandoned, suppressed or concealed" their inventions. The sentence of 35 USC 102(g) which embodies the reasonable diligence requirement puts no time limit on reasonable diligence. Indeed, the reasonable diligence standard expresses a policy favoring the first inventor. As stated in *Marconi Wireless Co.* v. *United States*, 320 U.S. 1, 34, 63 S.Ct. 1393, 1409 (1943):

> "It is well established that as between two inventors priority of invention will be awarded to the one who by satisfying proof can show that he first conceived of the invention."

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* "A claim which is the same as, or for the same or substantially the same subject matter as, a claim of an issued patent may not be made in any application unless such a claim is made prior to one year from the date on which the patent was granted."

The policy in favor of the party who first conceived of the invention is just as worthy as the policy in favor of early public disclosure.

The CCPA's remark about "a reservoir of 'reasonable diligence'" (App. 7a) apparently implies that no segment of an ongoing developmental program can ever qualify as reasonable diligence in reducing to practice an invention conceived after the start of such program. This view is not compelled by logic and is surely at odds with experience. Advanced technology and useful inventions are nurtured and arise from the confluence of separate arts and developmental programs. Since inventions tend to spring from commercial and practical motives an inventor should be permitted to engage in the preliminary and intermediate work regarded in good faith as necessary for a reduction to practice which can be expected to satisfy the inventor and achieve the goals which he has set. The natural inclination of a researcher or engineer is to develop his invention to the point of practical usefulness rather than into a laboratory curiosity. Budgets for research and development are finite. They should not be burdened with expenses to build mere laboratory devices solely to comply with a legal requirement which must seem arbitrary and unnecessary to the researcher.

III. The CCPA Decision Departs from the Customary Standard of Judicial Review.

a) The CCPA Decision Rejects the Accepted and Usual Standard of Judicial Review Expressly Subscribed to in CCPA Precedents.

The standard of judicial review to be followed by the CCPA is not articulated in 35 USC 141, 144, or any other statute, or any decision of this Court. The word "appeal"

as used in the statutes cited suggests the usual standard of judicial review rather than an independent and unreviewable decision on the facts of the case. The CCPA has, at times, subscribed to the accepted and usual standard of judicial review, *Hamer* v. *White,* 143 F.2d 987 (CCPA 1944), *Rodli* v. *Phillippi,* 154 F.2d 139, 140 (CCPA 1946), *Smith* v. *Hayward,* 176 F.2d 914, 923 (CCPA 1949), *Daley* v. *Wiltshire,* 293 F.2d 677 (CCPA 1961) and *Voisinet* v. *Coglianese,* 455 F.2d 1064, 1067 (CCPA 1972). In the *Hamer* case the court said (143 F.2d p. 990):

> "The board's responsibility in the case was analogous to that of a judicial trial tribunal, and, as an appellate tribunal, we are not at liberty to reverse its findings of fact unless convinced that such findings were clearly against the weight of the evidence.
>
> • • •
>
> Were we reversing the decision of the board it would be incumbent upon us to give a written review and point out the reasons for disagreement."

In the *Daley* case the CCPA reconfirmed the accepted and usual method of reviewing ultimate findings of fact (293 F.2d p. 681):

> "The question, however, is whether the record as a whole supports the board's conclusion, so that it is not manifestly wrong."

The present CCPA opinion does not analyze the record relating to the second segment of the critical period to determine whether the ultimate fact of Cricchi's diligence found by the Board was clearly against the weight of the evidence. Except for a reference to the time cards and Cricchi's own testimony, the opinion does not even recognize the existence of evidence supporting the Board's finding. The CCPA opinion states summarily (App. 8a):

> "Cricchi did not present any documentary evidence showing specific acts at specific times directed at a reduction to practice of the invention of the counts."

This statement flies in the face of the comprehensive, detailed and independently corroborated evidence of Cricchi's diligence. The CCPA's total disregard for the Board's summary of testimony supporting the holding of diligence (App. 20a, 21a) indicates that the CCPA no longer considers itself bound by the accepted and usual standards of judicial review.

b) The Evidence Pertinent to the Second Time Segment, October 1970 to September 1971.

On October 9, 1970 work was started at the Westinghouse Advanced Technology Laboratories in Baltimore, Md. on an integrated circuit memory array consisting of 256 MNOS memory transistors each embodying the invention (CX 13, TR 360, 459). The number "834", which identified the set of photographic masks needed to fabricate this MNOS array, was entered into the Westinghouse log book (CX 18) on October 23, 1970. Spicer received a request for the 834 mask set (CX 16) from Cricchi on October 20, 1970 and started to work on the 834 masks "within a day or two" (TR 575). His work included making accurate drawings, separating the drawings into the various levels corresponding to different steps in the fabricating process and then cutting the masks, one for each level of the process (TR 572, 573). His work corresponded to steps one through four in CX 101 (TR 575).

Another witness, Lancaster, was responsible for following the mask making activities in Spicer's area. He made the "834" entry in the log book (CX 18) and identified his "Job Summary for Mask Making Area" (CX 17) which showed the 834 mask series at step six in CX 101 on Janu-

ary 11, 1971 (TR 595). Lancaster gave a detailed explanation of the remaining steps in the mask making process and stated that a May 1, 1971 completion date for the photographic plates of the 834 mask series was "reasonable" (TR 600). He also authenticated a number of other documents (CX 21, 22, 27, 28, 30, 31, 32, 33, 36 and 37) relating to the making of the 834 mask series and dated in the period January-April 1971 (TR 600-610).

Ames was involved in the "making of masks from the reticle through the working plate processes" (TR 663) and identified his handwritten entries dated April 8, 1971 to April 20, 1971 relating to the 834 mask series in his contact printing log book (CX 20, CX 38, TR 664-5).

Ruehling was involved in building MNOS devices at Westinghouse, particularly the photoengraving steps (TR 454). He made tests on 834 wafers on June 3, 1971 (CX 45, TR 459) and stated that 834's were fabricated "at least as early as May and June of 1971" (TR 466). He identified CX 47, dated June 10, 1971 as the process sheet for the second lot of 834 devices (TR 465), and CX 102 as copies of the 834 mask set from which he made 834 arrays "in May of 1971" (TR 457, 490, 526). His testimony that each wafer he processed contained 69 active 834 arrays (TR 527) and that five wafers were in the first wafer lot he processed (TR 490) establishes that a total of 88,320 MNOS memory transistors each embodying the invention had been made at Westinghouse by June of 1971.

Shortly after work on the 834 mask series was initiated the Westinghouse Meter Division in Raleigh, North Carolina became interested in an automatic meter reading system (later identified as the 893 metering subsystem). Dr. Corak, who was Cricchi's supervisor, testified that "The heart of the 893 metering system is a ten-state counter

that has MNOS memory" (TR 344). The Meter Division initially authorized Cricchi to build up a counter with MNOS memory by using individual parts in a form approximating the integrated circuit which would be built at a later time, this assemblage of parts being known in the art as a Bread Board (CX 69, TR 235, 264). Ruehling testified that he built one Bread Board for the meter reading subsystem in March, 1971 (TR 466, 510) from the wiring diagram (CX 53) which Cricchi gave him, this Bread Board being introduced in evidence as CX III-1 (TR 404). Ruehling's testimony confirms Cricchi's own testimony that a Bread Board of the metering subsystem was built "shortly after March 1st, 1971" because they were "under pressure to build this particular device as soon as possible" and "had a commitment to our meter division to deliver the metering subsystem integrated circuits in July of 1971" (TR 236).

Britton was a design engineer at the Westinghouse Meter Plant in Raleigh, North Carolina. Under his supervision a second Bread Board of the proposed metering subsystem, CX III-2, was built (TR 392). Under covering letter dated July 7, 1971 (CX 1) Cricchi sent to Britton "10 packages of the 834 protected drain and source memory load element for your ten stage breadboard." Very shortly after receiving the 834 devices Britton built a ten stage counter incorporating the 834 devices. Britton operated the counter "in a nonvolatile manner" by the middle of August, 1971 (TR 416-418).

While Britton was building his counter in Raleigh and testing 834 devices in it, work proceeded in Baltimore on the integrated circuit known as the "893 metering subsystem chip" which also contained Cricchi's invention (TR 470). Lancaster identified the page of the Westinghouse log book (CX 50) which contained the entry of the 893

mask series (TR 609). Spicer identified five drawings dated from June 10, 1971 to July 11, 1971 (CX 46, 48, 54, 55 and 56) given to him by Cricchi "to generate a mask set" for the 893 integrated circuit (TR 566-568). Copies of the 893 mask layout (CX 60) dated July 28, 1971, the set of masks used for the 893 metering subsystem (CX 61) dated August 20, 1971, a list of "the major processing steps in sequence for the fabrication of the MNOS 893 metering subsystem" (CX 64) dated August 26, 1971, and the interconnection pattern for the 893 metering subsystem (CX 66) dated September 2, 1971 were also introduced (TR 258-264).

After Britton completed tests of the 834 arrays in his Bread Board at Raleigh in the middle of August, he built a CHIP tester "to functionally exercise the expected metering subsystem, the 893," (TR 419). Drawings of portions of the circuitry of the CHIP tester (CX 10) are dated August 31, 1971 and September 13, 1971 (TR 405-407).

By September 27, 1971 prototypes of the 893 integrated circuits had been made and tested so as to constitute "an actual reduction to practice of a device as defined in the counts of this interference on September 28, 1971" as found by the Board (App. 17a, 18a).

The CCPA's reversal of the Board's holding of reasonable diligence during the second segment of the critical period is predicated solely on what the Court regarded as the lack of probativeness of the time card charges (App. 7a-9a). However, the Board's holding of reasonable diligence had not been principally predicated on the time card charges but on its summaries of the testimony of witnesses (App. 20a, 21a) and on Naber's failure to challenge Cricchi's diligence during the second time segment (App.

22a). By reversing the Board's ultimate finding of diligence without giving "a written review and . . . [pointing] out the reasons for disagreement" with the Board, *Hamer* v. *White*, 143 F.2d p. 990, the CCPA deliberately departed from the usual and accepted standard of judicial review. Such departure is not authorized by the pertinent statutes, is not foreshadowed by the CCPA's own precedents, and calls for the exercise of this Court's power of supervision.

CONCLUSION

For the reasons set forth above, a writ of certiorari should issue to review the judgment and opinion of the CCPA.

Respectfully submitted,

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APPENDIX

APPENDIX

UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

Thursday, December 22, 1977

Before: Markey, Chief Judge, Rich, Baldwin, Lane and Miller, Associate Judges.

No. 77-556. CHARLES T. NABER and GEORGE C. LOCKWOOD v. JAMES R. CRICCHI. Opinion by Miller, Judge. The decision of the Board of Patent Interferences awarding priority to the junior party Cricchi for an invention directed to an improved "drain-source-protected" metal-nitride-oxide-semiconductor (MNOS) device which can be used as a nonvolatile, electrically alterable memory element in various integrated circuits, is *reversed*.

UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

Appeal No. 77-556
Interference No. 98,566

CHARLES T. NABER and
GEORGE C. LOCKWOOD,

Appellants,

v.

JAMES R. CRICCHI,

Appellee.

DECIDED: December 22, 1977

MILLER, Judge.

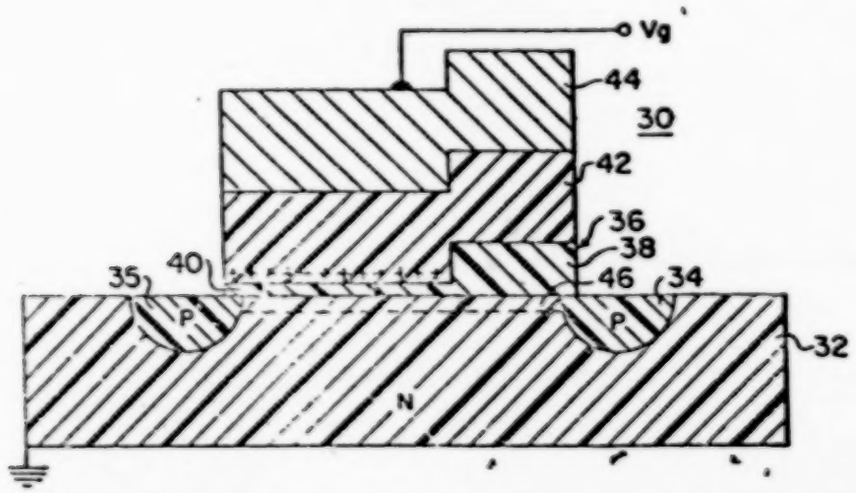
This appeal is from the decision of the Patent and Trademark Office Board of Patent Interferences (board) award-

ing priority of invention of the counts in issue to the junior party, Cricchi. The counts were copied by Cricchi[1] from a patent to Naber et al. (Naber) No. 3,719,866, issued March 6, 1973, and entitled "Semi-conductor Memory Device." The dispositive question, which the board decided in favor of Cricchi, is whether Cricchi was reasonably diligent from a time just prior to Naber's entry into the field (June 1970) until Cricchi's actual reduction to practice (September 1971). We reverse.

Subject Matter of the Counts

The invention is an improved "drain-source-protected" metal-nitride-oxide-semiconductor (MNOS) device which can be used as a nonvolatile, electrically alterable memory element in various integrated circuits. The specific improvement (illustrated by Figure 3 of the Naber patent) is that the silicon oxide layer (56) in the vicinity of the drain (54) and source (55) of the transistor is made thicker (shown at areas 58 and 60) than the corresponding layer in prior art devices.

Fig. 3



[1] In an amendment filed June 1, 1973, to his application serial No. 219,463, filed January 20, 1972, entitled "Enhancement Mode Limited MNOS Memory Device."

All of the counts include a recitation of this structure. Count 1 is illustrative and reads as follows:

Count 1

A metal-nitride-oxide-semiconductor device comprising:

a semiconductor material substrate of one conductivity having a first and a second region of opposite conductivity extending therein, said first and second regions being separated by a channel region having a channel formed therein through which majority carriers can flow from said first region to said second region, said first, second, and channel regions all extending from one surface of said substrate;

a layer of oxide material affixed to said one surface of said substrate to interface with the junction of said first region-channel region, said channel region, and the junction of said channel region-second region, said oxide layer having a first thickness in the vicinity of said first region-channel region junction and in the vicinity of said channel region-second region junction and a second thickness therebetween;

a layer of nitride material affixed to said oxide material and spaced apart from said substrate by said oxide material; and

a layer of conductor material affixed to said nitride material and spaced apart from said oxide material by said nitride material;

said first thickness being of more than a charge tunnel thickness to prevent any charge from tunneling between said oxide material-nitride material interface and said substrate-oxide material interface and said second thickness being of less than a charge tunnel thickness to allow charge to tunnel between said oxide material-nitride material interface and said substrate-oxide material interface.

Proceedings Below

The board found that Cricchi established conception of the subject matter of the counts on October 22, 1969, and concluded that the combined testimony of Cricchi's co-workers established——

> that at the time Cricchi conceived of the device . . . improvements were necessary in deposition processes of the oxide and nitride layers and that efforts to improve on the processes were part of a continuous program which extended from prior to October of 1969 into October of 1970.[2]

The board also found that Cricchi Exhibit 100, consisting of copies of time cards for four project numbers, "indicates reasonably continuous activity charged to the project numbers . . . used to identify the programs for constructing and testing the MNOS transistor" embodying the counts in issue. The board was not persuaded by Naber's argument that experiments directed at improving layer deposition techniques generally did not satisfy the "reasonable diligence" requirement, not being directed at construction and testing of the MNOS device of the counts. It said:

> [T]his work was required in order to reduce to practice the transistor conceived by Cricchi on October 22, 1969. Dr. Corak [Cricchi's supervisor] testified that improvement in the method of deposition was required in order to produce a useful device rather than a mere laboratory device.

In the Request for Reconsideration, Naber argued that Cricchi was not reasonably diligent during the period from June to October 1970 since work done then was directed at improving layer deposition techniques generally; further, that Cricchi Exhibit 100 was not proof of diligence during

[2] The program of improving deposition techniques was still going on in 1975 at Westinghouse, Cricchi's assignee.

the period from October 1970 to September 1971. The board adhered to its original decision.

OPINION

1. Work on Layer Deposition Techniques (June to October 1970)

The record shows that the work done at Westinghouse to improve oxide and nitride layer deposition techniques was generally applicable to all MNOS devices, not merely the "drain-source protected" device of the counts, and that this work had in fact commenced *prior* to Cricchi's conception of the invention. It is well settled that, to satisfy the "reasonable diligence" requirement of 35 USC 102(g), the work relied on must ordinarily be directly related to reduction to practice of the invention of the counts in issue. *Anderson* v. *Scinta*, 54 CCPA 1269, 372 F.2d 523, 152 USPQ 584 (1967); *Martin* v. *Snyder*, 41 CCPA 1010, 214 F.2d 177, 102 USPQ 306 (1954); *Gunn* v. *Bosch*, 181 USPQ 757 (Bd. Pat. Int'f 1973); *Moore* v. *Harris* v. *Hale*, 92 USPQ 187 (Bd. Pat. Int'f 1951). However, work in preparation for filing related patent applications may suffice (*e.g.*, *Rey-Bellet* v. *Englehardt*, 493 F.2d 1380, 181 USPQ 453 (CCPA 1974)), as may work required to develop a first invention in order to develop or reduce to practice a second invention (*e.g.*, *Keizer* v. *Bradley*, 47 CCPA 709, 270 F.2d 396, 123 USPQ 215 (1959); *Thompson* v. *Dunn*, 35 CCPA 957, 166 F.2d 443, 77 USPQ 49 (1948)).

There is no evidence that Cricchi's layer deposition techniques work was in preparation for filing related patent applications or was required to develop a first invention needed to proceed with the invention of the counts. Although the board found that "this work was required in order to reduce to practice" the invention of the counts,

both Cricchi and his supervisor admitted that a simple transistor embodying the structure embraced by the counts could have been built and tested for its memory characteristics.[3] Cricchi chose not to proceed to a reduction to practice with a simple transistor, but to wait until work on layer deposition techniques progressed.[4] Since he admittedly "possessed the capability of conducting such a test," it was his burden to reconcile the waiting period with the "reasonable diligence" requirement. *Litchfield* v. *Eigen*, 535 F.2d 72, 76, 190 USPQ 113, 116 (CCPA 1976).[5]

The board found, and Cricchi contends, that the work on layer deposition techniques was required to produce a "useful device," rather than a "mere laboratory device." However, there need not be commercial utility to have a reduction to practice. As this court said in *Goodrich* v. *Harmsen*, 58 CCPA 1144, 1153, 442 F.2d 377, 383, 169 USPQ 553, 559 (1971): "In the nature of things, testing goes on throughout the process of 'commercializing' and often con-

[3] Naber does not contend, nor would we agree, that Cricchi was under an absolute obligation to choose the simplest device embodying the structure of the counts to attempt a reduction to practice.

[4] Cricchi's brief contains the statement: "The fact that the demonstration device might have been constructed without doing this work [the process development work relating to layer deposition techniques] has been clearly recognized by Cricchi during all phases of this case."

[5] Public policy favors the early disclosure of inventions. This underlies the requirement for "reasonable diligence" in reducing an invention to practice, not unlike the requirement that, to avoid a holding of suppression or concealment, there be no unreasonable delay in filing an application once there has been a reduction to practice. See *Young* v. *Dworkin*, 489 F.2d 1277, 180 USPQ 388 (CCPA 1974).

tinues after a product is on the market where it usually receives its severest test." Acceptance of the proposition that the "reasonable diligence" requirement was satisfied, notwithstanding delay due to general work (on layer deposition techniques needed to produce a commercially-acceptable device), would, in effect, grant Cricchi a reservoir of "reasonable diligence" arising from work commenced prior to conception on October 22, 1969, and continuing into 1975. We are not persuaded that this accords with public policy favoring the early disclosure of inventions.

Cricchi's reliance on *Justus* v. *Appenzeller*, 177 USPQ 332 (Bd. Pat. Int'f 1971), is misplaced. In that case, a reduction to practice of the counts required a "bearing means" which Justus ordered to be custom made. Unforeseen circumstances delayed delivery of the bearings, with resultant delay in Justus' reduction to practice. Such circumstances are not present here. Cricchi had the materials and capability in June 1970 to produce a working MNOS memory device of the counts.[6]

We hold that work done at Westinghouse during the period from June to October 1970 directed at improving oxide and nitride layer deposition techniques generally applicable to all MNOS devices did not satisfy the requirement of "reasonable diligence" on the part of Cricchi.

2. Time Card Charges (October 1970 to September 1971)

Naber argues that Cricchi's testimony concerning the work performed under the four project numbers covered by time card charges of record is uncorroborated and, thus,

[6] On the record before us, the correctness of the board's conclusion, that such a device would have operated for only a "few hours" before failure, is questionable. In a proposal to the Air Force, Westinghouse indicated that it had developed an MNOS device early in 1969 that was operable for "greater than 1,000 hours."

cannot be used to show diligence; also, that work done under the project numbers after October 1970 was not directed at reducing to practice the invention of the counts.[7]

We are satisfied that at least some work done after October 1970 and charged to the project numbers had nothing to do with reducing to practice the invention of the counts. Thus, one Westinghouse employee (a Cricchi witness) testified that he did not begin working on the "834 device" (a device embodying the count limitations) until May 1971; but his time card charges show work done under the project numbers before that date.[8] This flatly contradicts testimony in the Cricchi record that if time was charged to the project numbers, the work being done was on the "834" project.

Naber's argument that Cricchi's uncorroborated testimony cannot satisfy the burden of showing "reasonable diligence" is well taken. *Kendall* v. *Searles,* 36 CCPA 1045, 173 F.2d 986, 81 USPQ 363 (1949). Cricchi did not present any documentary evidence showing specific acts at specific times directed at a reduction to practice of the invention of the counts. Instead, he relies on time cards showing work charged to four project numbers for this purpose. However, the time cards are not self-explanatory, and Cricchi's is the only testimony that undertakes to explain the work performed. Nothing in the record corroborates Cricchi's explanation. As pointed out above, testimony of

[7] Although appellants did not raise this issue in their main brief before the board, they did so in their Request for Reconsideration, and the board considered the argument in reaching its decision. Thus, the issue is properly before the court. Cricchi is incorrect in labeling the argument an improper new issue.

[8] Indeed, Cricchi admits this in his brief.

one of Cricchi's own witnesses contradicts his allegation that time charged to the project numbers was directed solely at a reduction to practice of the invention of the counts.

Accordingly, we hold that the time card charges of record and Cricchi's uncorroborated testimony concerning the work covered thereby do not satisfy Cricchi's burden of proving "reasonable diligence" during the period from October 1970 to September 1971.

3. Motion to Tax Costs

Naber has moved to assess printing costs against Cricchi for the portions of the transcript requested by Cricchi. These cover all of the testimony of Naber's witnesses. Cricchi states that his reason for including such testimony in the transcript was that Naber's Notice and Reasons of Appeal indicated that Naber would argue Cricchi's date of conception; that "[i]f Cricchi's date of conception was to be argued, this automatically raises the question of when did Naber et al. enter into the field."

Because Cricchi argued the issue of Naber's entry into the field before the board, it was not necessary for him to file a cross-appeal to preserve the issue for argument before this court. *Clauss* v. *Foulke,* 54 CCPA 1514, 379 F.2d 586, 154 USPQ 85 (1967). However, if that issue were to be argued before this court, it would have been Cricchi who would have raised the issue, Naber not having questioned the board's finding of Naber's date of entry into the field. Since the costs of printing the material necessary for the court to make a determination of the issues raised by appellee are normally assessed against appellee, *Meitzner* v. *Mindick,* 549 F.2d 775, 193 USPQ 17 (CCPA), *cert. denied,* 46 U.S.L.W. 3204 (October 4, 1977), Naber's Motion to Tax Costs to appellee Cricchi is granted.

The decision of the board awarding priority to Cricchi on counts 1-4 is *reversed.*

REVERSED

Final Hearing
March 18, 1976

Paper No. 50
SMU/dm

Mailed June 28, 1976—Patent & Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT INTERFERENCE

Patent Interference No. 98,566

Cricchi v. Naber, et al.

Semiconductor Memory Device

Application of James R. Cricchi filed January 20, 1972, Serial No. 219,463.

Patent granted Charles T. Naber and George C. Lockwood March 6, 1973, Patent No. 3,719,866, Serial No. 94,861 filed December 3, 1970.

Henson, Schron, O'Rourke, Renz, Hinson and Murray for Cricchi. Oral argument by James B. Hinson.

Cavender, Benjamin, Schellin and Stansbury for Naber, et al. Oral argument by Lawrence P. Benjamin.

Champion, Forrer and Urynowicz, Examiners of Interferences.

Urynowicz, Examiner of Interferences.

The invention at issue in this interference relates to a metal-nitride-oxide-semiconductor memory element which

exhibits the characteristic of being able to store charge to vary its threshold voltage. The oxide layer has thick portions in the vicinity of the drain and source regions of the element and a thin portion therebetween. The thick portions are provided to prevent low voltage breakdown of the drain-substrate and source-substrate diodes. The issue consists of four counts which read as follows:

Count 1

A metal-nitride-oxide semiconductor device comprising:

a semiconductor material substrate of one conductivity having a first and a second region of opposite conductivity extending therein, said first and second regions being separated by a channel region having a channel formed therein through which majority carriers can flow from said first region to said second region, said first, second, and channel regions all extending from one surface of said substrate;

a layer of oxide material affixed to said one surface of said substrate to interface with the junction of said first region-channel region, said channel region, and the junction of said channel region-second region, said oxide layer having a first thickness in the vicinity of said first region-channel region junction and in the vicinity of said channel region-second region junction and a second thickness therebetween;

a layer of nitride material affixed to said oxide material and spaced apart from said substrate by said oxide material; and

a layer of conductor material affixed to said nitride material and spaced apart from said oxide material by said nitride material;

said first thickness being of more than a charge tunnel thickness to prevent any charge from tunneling between said oxide material-nitride material interface and said substrate-oxide material interface and said second thickness being of less than a charge tunnel thickness to allow charge to tunnel between said oxide material-nitride material interface and said substrate-oxide material interface.

Count 2

The invention according to count 1 wherein said semiconductor material is silicon, said oxide material is silicon oxide, said nitride material is silicon nitride, and said conductor material is aluminum.

Count 3

The invention according to count 2 wherein the first thickness of said silicon oxide material is between 200 and 1,000 Angstroms, the second thickness of said silicon oxide material is between 15 Angstroms and 60 Angstroms, and the thickness of said silicon nitride material is between 400 Angstroms and 1,000 Angstroms.

Count 4

The invention according to count 2 wherein the first thickness of said silicon oxide material is approximately 400 Angstroms, the second thickness of said silicon oxide material is approximately 30 Angstroms, and the thickness of said silicon nitride material is approximately 750 Angstroms.

On October 17, 1974, Naber et al. filed motions under 37 CFR 1.231 to dissolve this interference as to all the counts (Paper No. 9). On November 5, 1974, the Patent Interference Examiner dismissed the motions in view of the fact they were not filed within the time set in Paper No. 3 and were not accompanied by an affidavit showing

of facts to justify excusing their belatedness (Paper No. 10). No other motions were filed. Both parties took testimony, filed briefs, and appeared at the final hearing. As junior party who filed this application prior to issuance of the senior party's patent, Cricchi has the burden of proving priority as to the counts by a preponderance of the evidence. Archer v. Gordon v. Freter, 426 F.2d 1402, 166 USPQ 322 (CCPA 1970).

This interference was declared with the junior party's application containing a showing under Rule 204(c). In declaring the interference, no order to show cause under Rule 228 was entered.

Naber et al. argue in their brief that they are entitled to either Summary Judgment or an award of priority due to a fatally defective Affidavit under Rule 204(c) in that the Junior Party Cricchi has failed to set forth facts of an invention, or in the alternative, has failed to set forth facts of an invention prior to the filing date of the Senior Party, and has failed to show or set forth facts indicating how he meets the counts of the interference.

The Commissioner of Patents in Walsh et al v. Sakai et al., 167 USPQ 465 (1970) held that:

> The examination of a showing under Rule 204(c) is essentially ex parte in nature as an incident to the declaration of interference. Rule 228 makes specific detailed provisions for the procedure to be followed if an order to show cause is entered because the ultimate substantive rights of the junior applicant are affected. However, there is no provision for the senior patentee to seek such an order because the ultimate substantive rights of the senior patentee are not affected. In essence, the nonentry of the order is merely a ruling that "the interference will proceed in the normal manner." The summary judgment stage

> under Rule 228 having been passed, there is no occasion for reversion to that stage at the behest of the senior patentee."

In view of the above holding, we are of the opinion that Naber et al. are not entitled to a review of the Rule 204(c) showing made by Cricchi.

Cricchi contends that the record submitted on his behalf establishes that he conceived the subject matter of the counts prior to the earliest date of conception (May 11, 1970) alleged by Naber et al., that he actually reduced his invention to a practice as early as June 28, 1971, and that he has exercised reasonable diligence from a time just prior to Naber et al.'s entry into the field to his actual reduction to practice.

Cricchi testified that he has a bachelor of science degree in electrical engineering and that he has been employed by Westinghouse Electric Corporation (Westinghouse) in Baltimore, Maryland since 1953. With respect to his alleged conception, Cricchi testified that his Exhibit 12 is a proposal Westinghouse submitted to the Air Force Avionics Laboratory prepared in September-October of 1969, and that Figure 2-28B on page 2-53 shows the MNOS transistor which he conceived which was to eliminate the problems of high electric fields in areas between the gate and the drain, and the gate and the source.

Dr. William C. Corak testified to the effect that he has been employed by Westinghouse in Baltimore, Maryland since October of 1947, that he presently is Manager of Solid State Technology in the Science and Technology Department of the Systems Development Division, and that he has supervised Cricchi approximately since 1966. Dr. Corak indicated that Cricchi Exhibit 12 is a technical proposal prepared in September-October of 1969 by Westing-

house for the United States Air Force of which Cricchi was the primary author or technical person responsible, that he read and understood the proposal at the beginning of October of 1969, that Cricchi told him the structure illustrated in Figure 2-28B of page 2-53 was his idea, and that Cricchi explained the advantages of the stepped oxide structure to him at that time.

Cricchi Exhibit 12 bears the date October 22, 1969. Figure 2-28 of page 2-53 illustrates the cross-section of an MNOS device having an N type silicon substrate with P type regions diffused at the upper surface thereof forming a source and a drain, a dual thickness silicon oxide layer located directly above the substrate and overlapping the source and drain regions, a layer of silicon nitride located directly above the silicon oxide layer, and a layer of material located above the silicon nitride forming a gate electrode. Thicknesses for the dual thickness silicon oxide layer are given as ranges of 20-40A and 100-200A. Page 2-54 of Cricchi Exhibit 12 gives further thickness ranges for MNOS memory structures of 200-300A for oxide layers and 750-1500A for nitride layers.

In their brief Naber et al. argue that the testimony of Dr. Corak is based on information derived solely from the inventor, Cricchi, and is not of his own personal knowledge and accordingly, this testimony can be afforded no weight to corroborate the alleged conception by Cricchi. In support of their position, Naber et al. cite Anderson et al. v. Crowther et al., 152 USPQ 504 (Bd. Pat. Int. 1965) and Thurston v. Wulff et al., 35 CCPA 794, 164 F.2d 612, 76 USPQ 121 (1947).

We are not persuaded by the above argument of Naber et al. The cases relied upon by Naber et al. relate to corroboration of an actual reduction to practice, not to cor-

roboration of conception by an inventor which is here at issue. It is well established that the fact that an oral disclosure was made at an alleged time must be proved by the testimony of the person to whom the disclosure was made or of some one who overheard the disclosure. Townsend v. Smith, 17 CCPA 647, 36 F.2d 292, 4 USPQ 269 (1930). Here, the fact that an oral disclosure was made by Cricchi is proved by the testimony of Dr. Corak to whom the disclosure was made. Additionally, the evidence herein indicates that someone at Westinghouse had the complete concept and that the originator seems to have been Cricchi. There is no evidence to the contrary. Bedford v. Boothroyd et al., 51 CCPA 713, 319 F.2d 200, 138 USPQ 42 (1963). Accordingly, we are of the opinion that Exhibit 12 of Cricchi, as testified to by Cricchi and the corroborating witness, Dr. Corak, is adequate to establish conception of the subject matter of the counts in issue on October 22, 1969, the date of the above Exhibit 12.

With respect to actual reduction to practice of the device conceived on October 22, 1969, Cricchi testified to the effect that the MNOS device illustrated in Figure 2-28B of his Exhibit 12 was used to construct a memory array known as the 834, that his Exhibit 51 shows test results taken from the array, and that the test results indicate the memory would operate for its intended purpose. Exhibit 51 is dated July 1, 1971.

Dr. Corak indicated that the 834 is a matrix array comprising the MNOS elements illustrated in Figure 2-28B of Cricchi Exhibit 12 and that the 893 is the designation given to a metering system at Westinghouse, the heart of which is a ten stage counter that has the MNOS memory which is shown in Figure 2-28B of Cricchi Exhibit 12. Dr. Corak further indicated that Cricchi Exhibit 51 is a record in Cricchi's handwriting.

James Britton testified to the effect that he was a design engineer at the Westinghouse Meter Plant in Raleigh, North Carolina, that Cricchi Exhibit 11 is a report of a trip made by Cricchi to the Westinghouse Metering Division in Raleigh, on September 27 and 28, 1971, that during this visit the counters in 893 devices having the MNOS memory were tested by Cricchi and himself by rapid power cycling, removal of the power to the counters, removal of the memory from the circuit, insertion of the memory back into the circuit, reapplication of the power, and sensing of the memory state. The memories were found to retain their original states even though power had been removed for as long as an hour. Britton further testified to the effect that the memories had to retain their states for more than 15 minutes to be considered good devices.

We are of the opinion that the record submitted by Cricchi is inadequate to establish an actual reduction to practice of the apparatus defined by counts in July of 1971, the date of Cricchi Exhibit 51. It is well-established that to establish an actual reduction to practice, the testimony of an inventor must be corroborated and that records prepared by an inventor are merely self-serving documents which, standing alone, do not effect such corroboration. Searle v. Glarum et al., 37 CCPA 896, 199 F.2d 874, 84 USPQ 454 (1950). Dr. Corak did not indicate that he witnessed and understood tests performed by Cricchi in July of 1971 but merely that Exhibit 51 was in Cricchi's handwriting. Exhibit 51, being a record prepared by the inventor, stands alone, and is merely a self-serving document which does not effect corroboration.

In view of the testimony of Britton, the content of Cricchi Exhibit 11 referred to therein and the lack of opposition of the party Naber et al., we are further of the opinion that Cricchi has established an actual reduction to

practice of a device as defined in the counts of this interference on September 28, 1971, the latter date of Cricchi's recorded trip to Raleigh, North Carolina which appears in Exhibit 11.

Since he has established conception prior to any date alleged by Naber et al. and has established an actual reduction to practice after the filing of the Naber et al. application on December 3, 1970, a constructive reduction to practice, Cricchi can prevail only if he has established reasonable diligence from a time just prior to Naber et al.'s entry into the field until his actual reduction to practice on September 28, 1971. Naber et al. contend that they conceived the invention as defined in the counts, and therefore entered the field, in June of 1970.

In support of their contention as to conception, Naber et al. rely on testimony by Naber and Herman E. Austen, an engineer who shared the same office with Naber at National Cash Register Corporation (NCR) and Naber et al. Exhibit 1. Both Naber and Austen testified as to the content of Exhibit 1 and as to the fact that they signed Exhibit 1 on June 2, 1970. Examination of Exhibit 1 reveals that an MNOS device having two insulator thicknesses in the gate region is disclosed therein. The insulator is disclosed as thicker over the drain area of the device than it is over the channel and source areas. In comparison, the counts require an MNOS device having thick oxide portions over the drain and source regions and a thinner oxide over the channel portions. It is well-established that a disclosure relied on for conception must show every essential element of the invention as defined in the count of the interference. Cislak v. Wagner, 42 CCPA 70, 215 F.2d 275, 103 USPQ 39 (1954). Here it is clear that the disclosure of Naber et al. Exhibit 1 does not show

every essential element of the invention as defined in the counts in that it does not show a thicker portion of oxide over the source area. Accordingly, Exhibit 1 of Naber et al. and the above testimony relating thereto are inadequate to establish conception by Naber et al. of the device as defined in the counts on June 2, 1970.

Naber et al. further rely on an Invention Disclosure Record, Naber et al. Exhibit 26, signed and witnessed on September 22, 1970, in order to establish conception of the device as defined in the counts. However, since Naber et al. have submitted other documentary evidence as to an actual reduction to practice having an earlier date, we will first discuss the sufficiency of this evidence as it relates to Naber et al.'s entry into the field.

John K. Stewart, Jr. testified that he was first employed by NCR on July 11, 1966. He indicated that he began working for Naber in 1968-1969 doing photo resist work and some electrical testing. He testified to the effect that he made Naber et al. Exhibit 2 at Naber's direction, that Exhibit 2, dated June, 1970, shows nine MNOS transistors having different gate structures, that #1 is a tri-gate transistor and that #2 is a standard non-memory transistor. Stewart described the tri-gate transistor as having its memory portion centered between the source and drain, and having the thinner oxide in the center and the thicker oxide overlapping the source and drain. In June of 1970, Stewart noted the thinner oxide was less than 100 Angstroms and the thicker oxide was around 800 Angstroms. He indicated that Exhibits 47 and 48 of Naber et al. show test data that he took from transistors on wafers having the structure shown in Exhibit 2.

After careful consideration we are of the opinion that Exhibit 2 of Naber et al. and the testimony of John K. Stewart, Jr. relating thereto are adequate to establish

that Naber et al conceived the invention as defined in counts 1-4 in June of 1970 and thus entered into the field at that time. Accordingly, discussion of Naber et al.'s further proofs as to conception which relate to a period after June 1970 is unnecessary.

In an attempt to establish reasonable diligence, Cricchi relies on testimony by himself, associates at Westinghouse, and numerous exhibits. Cricchi indicated that during October of 1969 and beyond, he was doing continuous work directed toward fabrication of the device illustrated in Figure 2-28B of his Exhibit 12 involving different processes for depositing nitride and oxide films of different thicknesses. He indicated this work continued through October of 1970 and was necessary to fabrication of the device shown in Figure 2-28B. He testified to the effect that in the latter half of 1970 a mask set for an array which incorporated the memory of the above-noted figure was developed, that this work was begun by Kenneth Douglas Spicer and Edgar Dale Lancaster, Jr., both of whom were employed at Westinghouse, around October 23, 1970, that it took about six months to produce an actual memory device and that numerous tests were performed on the memory device in the middle and latter portions of 1971.

According to the testimony of Kenneth Douglas Spicer, a technician in the Environmental Test Area of Westinghouse in Baltimore, Maryland, mask sets for the Cricchi 834 and 893 devices were built beginning October of 1970 continuing into March of 1971. His testimony indicates that it took about ten weeks for him to complete the steps of the mask making process which he was required to perform.

Edgar Dale Lancaster, Jr. indicated that in the period 1969-1972 he was an assistant engineer at Westinghouse in Baltimore, Maryland supervising mask-making processes

and that he was involved in making mask sets identified as the 834 and 893. He further indicated that the process of making these masks began in October of 1970 and extended into May of 1971 as part of a continuous effort, and testified as to the type of work that was done during specific portions of the above period.

It appears from the testimony of John Carlson Ames that in the period from mid-1969 to early 1972 he was working in the Solid State Laboratory Group in the mask-making facility of Westinghouse and was responsible for the processing involving the making of masks from the reticle through working plate processes. Ames testified as to specific dates in April of 1971 wherein 834 masks were made by production-line people who did contact printing.

Fred Nagel testified that in the period of 1970 and 1971 he was responsible for packaging of semiconductor devices at Westinghouse. He indicated that in mid to late 1971 he was packaging 834 devices for Ronald Cricchi and identified devices that were packaged no later than September or October of 1971.

The combined effect of the testimony of Dr. Corak, James Britton, and Barry W. Ruhling, who worked for Cricchi at Westinghouse processing and testing MNOS devices, is that at the time Cricchi conceived of the device of Figure 2-28B of his Exhibit 12, improvements were necessary in deposition processes of the oxide and nitride layers and that efforts to improve on the processes were part of a continuous program which extended from prior to October of 1969 into October of 1970. Their testimony further indicates that in the period June of 1971 through September of 1971 numerous tests were performed on the MNOS devices which were included in 834 arrays and 893 metering systems.

Walter Tolj testified that he was Financial Manager for Engineering at Westinghouse and indicated that Cricchi Exhibit 100 includes reproduced copies of the original time cards turned in by engineers whose names appear at the top of the cards.

For the critical period extending from just prior to Naber et al.'s entry into the field in June of 1970 until his actual reduction to practice on September 28, 1971, Cricchi Exhibit 100 indicates reasonably continuous activity charged to the project numbers 60605CG, 60605DG, 61605CG, and 61605DG, which numbers were used to identify the programs for constructing and testing the MNOS transistor of Figure 2-28B of Cricchi Exhibit 12.

In their brief Naber et al. argue that the experiments at Westinghouse from just prior to June, 1970 into October, 1970 relating to improvements in the process of depositing oxide and nitride layers cannot be relied upon by Cricchi to establish diligence since the experiments concern improvement in the method of depositing layers generally, not the construction and testing of the MNOS transistor at issue. In support of their position Naber et al. cite Gunn v. Bosch and Pollmann, 181 USPQ 759, (1973). Naber et al. have not argued that the proofs relied on by Cricchi do not establish reasonable diligence for the remaining portion of the critical period in question.

After careful consideration, we are of the opinion that Cricchi has established reasonable diligence from just prior to Naber et al.'s entry into the field in June of 1970 until his actual reduction to practice on September 28, 1971. We are not persuaded by the argument set forth by Naber et al. above. Although the work by Cricchi into October of 1970 did not consist of the construction of the MNOS device as defined in the counts, it is clear from the testi-

mony of Dr. Corak, and Dr. James Kendall, one of Naber et al.'s own witnesses, that this work was required in order to reduce to practice the transistor conceived by Cricchi on October 22, 1969. Dr. Corak testified that improvement in the method of deposition was required in order to produce a useful device rather than a mere laboratory device. Dr. Kendall testified to the effect that in 1968, everyone in the field still had a great deal of work to do in order to obtain good oxide and nitride layers and that in 1969 those problems had been solved at NCR. Dr. Kendall indicated he was aware of what Westinghouse was doing and at that time it appeared that they had not solved the deposition problems.

In view of our findings that Cricchi has established conception of the subject matter of the counts in issue on October 22, 1969, that he actually reduced the invention to practice on September 28, 1971, and that he was reasonably diligent from a time just prior to Naber et al.'s entry into the field in June of 1970 until his actual reduction to practice, Cricchi, the junior party, is entitled to prevail.

Priority of invention of counts 1-4 is hereby awarded to James R. Cricchi, the junior party.

Marvin A. Champion
Examiner of Interferences
Donald D. Forrer
Examiner of Interferences
Stanley M. Urynowicz, Jr.
Examiner of Interferences
Board of Patent Interferences

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT INTERFERENCES

Patent Interference No. 98,566

Cricchi v. Naber et al.

Reconsideration

Champion, Forrer and Urynowicz, Examiners of Interferences.

Urynowicz, Examiner of Interferences.

Naber et al. have filed a petition under 37 C.F.R. 1.256(b) for reconsideration of that portion of our decision of June 27, 1976 holding that Cricchi, the junior party, was reasonably diligent from a time just prior to Naber et al.'s entry into the field in June of 1970 until his actual reduction to practice on September 28, 1971. On October 13, 1976, Cricchi filed a response to the Naber et al. petition for reconsideration. On October 26, 1976 Naber et al. filed a rejoinder brief and Cricchi filed a response to the rejoinder brief on November 3, 1976.

The rejoinder brief and response thereto have been given no consideration as they are not provided for under 37 C.F.R. 1.256(b).

In their petition for reconsideration, Naber et al. urge that the testimony of Cricchi, Dr. Corak and Dr. Kendall does not support the Board's conclusion that the June-

October 1970 work to improve the technology of silicon dioxide and silicon nitride thin film formation was necessary to actually reduce the memory transistor to practice. We consider that due to the uncertainties involved in the formation of nitride and oxide films at the time in question Cricchi's work in attempting to remove these uncertainties comprises a necessary and expeditious program, and reasonable diligence toward actually reducing the device defined by the counts to practice. The testimony of Cricchi and Dr. Corak, taken as a whole, indicates that even though the device at issue possibly could have been built without the additional work on layer formation, the technology had not been developed at Westinghouse to the point where such devices could have been constructed with the expectation that they would exhibit the necessary properties and characteristics required of memory devices. Although the testimony of Dr. Kendell indicates that even without solving the nitride problems one could still make devices which would last for a few hours, this testimony does not establish that the devices would have memory retentivity of a few hours or any significant memory retentivity at all, but merely that memory devices could operate for a few hours before they would fail. It is apparent that transistors of such limited life expectancy cannot be deemed of any practical memory use and therefore operable devices. In contrast, memory devices built after the June-October 1970 work on layer formation were tested and deemed satisfactory for use in the 893 system. Cricchi's witness, Britton, subjected these devices to diverse tests, i.e. memory retention with rapid power cycling and memory retention with power off. At this time, Cricchi concluded that all of the subsystems of the 893 device were operating correctly (Cricchi Exhibit 11).

The patents attached to Naber et al.'s petition were not part of their record at final hearing and were not considered by us at that time. Accordingly, they have been given no consideration herein as they are not subject matter for reconsideration.

Naber et al. raise a new issue in their petition urging that the appearance of Project Number Z61605CG on Cricchi Exhibit 73 suggests that much work not related to a reduction to practice of the subject matter of the counts was in fact performed by Cricchi or in his behalf during the critical period. We are of the opinion that Cricchi Exhibit 73 alone is inadequate to establish the above conclusion urged by Naber et al. By itself Exhibit 73 does not evidence that much work unrelated to a reduction to practice of the 834 arrays was charged to the project numbers appearing in Cricchi Exhibit 100. At best it merely suggests the possibility that this could have occurred. However, the testimony in the Cricchi record is clear that only work related to the construction and testing of the 834 device was charged to the project.

Accordingly, the petition of Naber et al. is granted to the extent of reconsidering our decision but is denied to the extent of making any changes therein.

Marvin A. Champion
Examiner of Interferences
Donald D. Forrer
Examiner of Interferences
Stanley M. Urynowicz, Jr.
Examiner of Interferences
Board of Patent Interferences

BELL TELEPHONE LABORATORIES, INCORPORATED

v.

HUGHES AIRCRAFT COMPANY, Appellant, and General Instrument Corporation.

No. 77-1061.

United States Court of Appeals, Third Circuit.

Argued Sept. 6, 1977.

Decided Oct. 25, 1977.

OPINION OF THE COURT

MARIS, Circuit Judge.

This is an appeal by Hughes Aircraft Corporation (herein "Hughes") from a final judgment of the district court in favor of the plaintiff in an action brought by Bell Telephone Laboratories, Inc. (herein "Bell") against Hughes and General Instrument Corporation to establish priority of invention as among their conflicting patents. Judgment by default having been entered against General Instrument Corporation, it is no longer involved in the case. Bell and Hughes hold interfering patents claiming the same invention, the Bell patent being Patent No. 3,475,234 applied for March 27, 1967 by Robert E. Kerwin, Donald L. Klein and John C. Sarace and issued October 28, 1969 to Bell as assignee, and the Hughes patent being Patent No. 3,544,399 applied for October 26, 1966 by Hans G. Dill and issued December 1, 1970 to Hughes as assignee. The judgment of the district court awarded priority of invention to Bell over Hughes and it is that determination which Hughes attacks on this appeal.

The invention involves a process for manufacturing a type of electronic amplifying device commonly known as a silicon gate field effect transistor. Hughes concedes, and

the district court found, that the invention was conceived by Bell's inventors in the period February-March 1966 and that Dill, the Hughes inventor, did not conceive the invention until May of that year. However, the parties also agree and the district court found that reduction to practice of Dill's invention took place not later than October 26, 1966 when he filed his patent application, whereas Hughes contended and the court found that reduction to practice of the Kerwin, Klein and Sarace invention did not take place until the period December 1966-January 1967. Therefore, in order to establish its claim to priority Bell sought to prove that it had exercised reasonable diligence in reducing the invention to practice.[1] The district court after considering the voluminous evidence offered on this issue found as a fact that Bell had exercised reasonable diligence in this regard during the significant period of time, May to December, 1963, and awarded priority of invention to Bell. A more detailed description of the facts is contained in the opinion filed by Judge Wright in the district court, 422 F.Supp. 372, and need not be repeated here. Whether the finding of reasonable diligence was erroneous is the specific issue which Hughes raises on this appeal.

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[1] 35 U.S.C. § 102 provides:

A person shall be entitled to a patent unless—

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

The appellant accepts, as it must, the fact that Rule 52(a) F.R.C.P. requires this court to affirm the findings of fact of the district court unless we can say that they are clearly erroneous. Whether reasonable diligence has been exercised is a question of fact. *Electro-Metallurgical Co.* v. *Krupp Nirosta Co.*, 122 F.2d 314, 317 (3d Cir. 1941), *cert. denied*, 314 U.S. 699, 62 S.Ct. 480, 86 L.Ed. 559 (1942). Hughes contends, however, that the application of Rule 52(a) must be modified in this case and presents three arguments in support of that contention. First, it argues that the district court misconceived and misapplied the applicable legal standard as to what work constitutes reasonable diligence in such a situation. It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered.[2] But whether particular work is sufficiently connected with the invention to be considered to be in the area of reducing it to practice must be determined in the light of the particular circumstances of the case which may be as varied as the mind of man can conceive. It is thus peculiarly a question of fact for the finder of the facts to determine in the light of those circumstances. Here the district court found that the work performed by Bell was sufficiently within that area to constitute reasonable diligence. Our consideration of the record satisfies us that this finding was not erroneous, let alone clearly so.

The appellant next argues that as a matter of law Bell should not be found diligent in view of the fact that after June 1966 it cut back the number of staff members assigned to work on the invention. As to this, the record

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[2] *Riche* v. *Permutit Co.*, 47 F.Supp. 275 (D.Del. 1942), *affirmed per curiam*, 135 F.2d 922 (3d Cir. 1943), upon which the appellant relies, was such a case.

shows, and the district court found, that probe testing in June 1966 indicated that the device produced by the process of the invention functioned successfully. What remained was the work of developing the process to a point where it would produce a commercially usable device, a task which did not necessarily require the work of as many staff members. Here again the question was one of fact for determination by the fact finder. We see no error in the district court's resolution of it.

Finally, the appellant urges that the district court should not have considered as evidence of reasonable diligence the oral recollection of the inventors uncorroborated by documentary evidence. While it has been held that the uncorroborated testimony of an inventor on essential issues of priority is highly suspect and such testimony should, therefore, generally be supported by corroborating evidence, *Campbell* v. *Spectrum Automation Co.*, 513 F.2d 932, 937-938 (6th Cir. 1975); *Gould* v. *Schawlow*, 363 F.2d 908, 919, 53 CCPA 1403 (1966), the corroborating evidence need not take any particular form, *MacMullen* v. *Santelli*, 326 F.2d 1008, 1013, 51 CCPA 978 (1964), but may be either documentary or oral, *Allen* v. *Blaisdell*, 196 F.2d 527, 529, 531, 39 CCPA 951 (1952). Since the function of the corroborating evidence is to assist the fact finder in deciding whether the inventor's testimony is credible, the question whether its amount and quality is adequate for that purpose is peculiarly for the fact finder to pass upon in the light of the circumstances of the case. *Mathieson Alkali Works* v. *Crowley*, 78 U.S.App.D.C. 163, 164, 138 F.2d 281, 282 (1943); *Bennett* v. *Serota*, 477 F.2d 1385, 1390-1391 (Cust. & Pat.App. 1973). Here the district court found that the testimony of the Bell inventors as to their work in reducing their invention to practice was sufficiently supported by corroborating evidence to be credited. We find no error in this regard.

In sum, we conclude from our examination of the record in this case that the district court did not err in its finding that Bell was reasonably diligent in reducing its invention to practice. Accordingly, its determination that Bell as first inventor is entitled to priority for its patent must be sustained. Our conclusion makes it unnecessary for us to consider Bell's alternative contention in support of affirmance that it reduced its invention to practice in June 1966 when it made its successful probe tests, a date prior to Hughes' reduction to practice.

The judgment of the district court will be affirmed.

BELL TELEPHONE LABORATORIES, INCORPORATED, Plaintiff,

v.

HUGHES AIRCRAFT COMPANY and General Instrument Corporation, Defendants.

Civ. A. No. 74-238.

United States District Court, D. Delaware.

July 19, 1976.

OPINION

CALEB M. WRIGHT, Senior District Judge.

Plaintiff, Bell Telephone Laboratories, Inc. ("BTL"), seeks relief under 35 U.S.C. § 291[1] against defendants

[1] 35 U.S.C. § 291 provides:

The owner of an interfering patent may have relief against the owner of another by civil action, and the court may adjudge the question of the validity of any of the interfering patents, in whole or in part. The provisions of the second paragraph of section 146 of this title shall apply to actions brought under this section.

Hughes Aircraft Co. ("Hughes") and General Instruments Corp. ("G.I."). BTL alleges that an interference exists between its United States Letters Patent Number 3,475,234 (the Kerwin patent), and United States Letters Patent Numbers 3,544,399 (the Dill patent) and 3,576,478 (the Watkins patent), owned by Hughes and G.I. respectively. BTL seeks an adjudication of that interference and a declaration that it is the sole owner of the patent rights in interference.

This Court has jurisdiction under 28 U.S.C. § 1338 (a). Since plaintiff, BTL, is a New York corporation and both defendants are Delaware corporations venue is proper under 28 U.S.C. § 1391(c). *Cf., Standard Oil Co.* v. *Montecatini Edison, S.p.A.,* 342 F.Supp. 124 (D.Del. 1972).

Previously this Court has entertained a suit in which Hughes charged General Instruments with infringement of the Dill patent. General Instruments defended on the grounds, *inter alia,* that the Dill patent was invalid by reason of Watkins' prior invention. After separate trial on this priority issue, this Court held that although Watkins had conceived the invention in March of 1965, Watkins did not reduce the invention to practice until the filing of a patent application on November 17, 1966. Dill, however, was found to have conceived on May 1, 1966, and to have reduced to practice constructively by the filing of a patent application on October 26, 1966. Since Watkins was the first to conceive but the last to reduce to practice, his diligence from Dill's conception until his own filing was necessary to a finding that he was the prior inventor. No such diligence was found and Hughes prevailed. *See Hughes Aircraft Co.* v. *General Instruments Corp.,* 374 F.Supp. 1166 (D.Del. 1974). Before further proceedings on the remaining validity and infringement issues in that case occurred, the present suit was filed by BTL.

At an early stage in these proceedings, Hughes moved for dismissal on the ground that no interference existed. This Court was unwilling to hold on the record then extant that the patents were non-interfering. Accordingly that motion was denied. 185 U.S.P.Q. 660. G.I. participated in the briefing of that motion and urged that a three-way interference existed. However, as a result of a settlement agreement with Hughes, G.I. ceased participating in these proceedings prior to the argument on the Hughes' motion. *See* 185 U.S.P.Q. at 661.

Following denial of the dismissal motion, Hughes dropped its position that the Kerwin and Dill patents were non-interfering and the case proceeded to trial on the merits. The matter is now ready for decision.

The purpose of a suit under 35 U.S.C. § 291 is to establish priority of invention as between patentees. Priority is determined by the standard found in 35 U.S.C. § 102(g):

> . . . In determining priority of invention, there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

In the instant suit, the parties have stipulated to the Hughes dates determined by this Court in the *Hughes* v. *General Instrument* infringement action.[2] The parties therefore presented this Court with proofs only respecting BTL's dates of conception and reduction to practice. In the event that the Court were to determine that the Ker-

[2] The Dill invention was conceived on May 1, 1966, and reduced to practice with the filing of the patent application on October 26, 1966.

win invention was conceived prior to May, 1966, and reduced to practice after October 26, 1966, BTL also sought to show that the Kerwin inventors exercised diligence from prior to May 1966 until such time as they had achieved a reduction to practice.[3]

The invention in the priority contest is directed to a semi-conductor device known as a "silicon-gate field effect transistor". ("S.G.F.E.T."). A field effect transistor ("F.E.T.") is a three-electrode electronic amplifier formed in a small semi-conductor. The semi-conductor is usually silicon and is referred to as a "slice", "chip", or "wafer". The three electrodes are known as the "source", "drain", and "gate". The source and the drain electrodes are formed in the silicon wafer by "doping" selected portions of the wafer with selected impurities. The area separating the source and drain is known as the "channel", and normally will resist the flow of current. However, in an F.E.T., the channel is overlayed with an insulating layer, and the gate electrode is formed on top of that layer. When an appropriate voltage is applied to this gate, current is able to flow along the previously resistant path between the source and drain. Further, variations in the voltage applied to the gate will result in variations in the current flowing between the source and drain.

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[3] BTL did not attempt to prove a date of conception prior to March of 1965, the date of conception awarded to G.I., 374 F.Supp. 1171. However, since BTL was not a party to the prior suit, it is not bound by any of this Court's findings in that action. Further, there was no attempt here to establish G.I.'s March 1965 date. Accordingly, this Court need not address the issue of whether, under 35 U.S.C. § 102(g), a March 1965 conception by G.I. would moot the issue of BTL's diligence, assuming BTL conceived before Hughes, but after March 1965, and reduced to practice after November 17, 1966.

Prior to the development of the invention in suit, a major problem in fabricating these devices was the positioning (or alignment) of the gate electrode. The devices are of very small dimensions and it was desirable to make them even smaller. It accordingly was very difficult to align precisely a strip of metal (usually aluminum) on top of the insulator which overlaid the channel separating the source and drain.

The S.G.F.E.T. avoided this alignment problem completely by virtue of its so-called "self-alignment" feature. To effect self-alignment, a silicon layer is positioned over the insulating layer covering the channel on the chip prior to forming the source and drain regions. The doping or diffusion step which results in formation of the source and drain is then performed. The silicon acts as a "mask" during this step and prevents doping of the channel region. The source and drain are thus formed precisely at the edges of the silicon gate, and the gate itself becomes sufficiently doped to become a conductor and thus act as an electrode.

This sequence, performing the diffusion step after placement of the gate electrode, had been impossible using the prior art, for the metal gates, usually aluminum, would melt at the temperatures required for diffusion.

The Work At Bell Telephone Laboratories.

Work on a S.G.F.E.T. by the Kerwin[4] group can be traced to a meeting held at BTL in February, 1966. The

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[4] The named inventors on the BTL patent are Robert E. Kerwin, Donald L. Klein and John C. Sarace. At all relevant times, Klein was supervisor of the group which included Kerwin and Sarace. (PX-3; T-43-44, 275, 680). Since Kerwin was the first-named inventor, the Court as a matter of convenience uses the terms "Kerwin group" and "Kerwin invention".

meeting was called by Donald Klein, and was attended by members of his research group, as well as by other BTL technical personnel. Kerwin and Sarace were among those attending the meeting. (T-49, 278, 680).

The purpose of the meeting was to discuss problems which arose in making integrated circuits composed of large numbers of solid state devices. A significant problem respecting "yields" was always present in the manufacture of the circuits in a multi-step process. Even when each step in a process was highly efficient and resulted individually in a high yield, after a sequence of many such steps had been performed on a given device array, the percentage of operative devices in the array would be unsatisfactorily low. To overcome this problem, Klein hoped that his group would be able to come up with a so-called "go, no-go" sequence of device fabrication steps. A sequence of "go, no-go" process steps could approach 100% efficiency for it envisaged the use of materials which either would or would not be subject to reaction in a given chemical process step. (T-45-47; 49-50).

During the course of this meeting, at which a variety of potential process steps were discussed, Kerwin came to the key realization that placement of a thermally resistant gate prior to doping of the source and drain regions would eliminate the problems encountered in aligning the gate electrode. (T-280-85). Silicon, a material with which the group had experience, was the thermally resistant material chosen. (T-286). The S.G.F.E.T. fabrication process which resulted from this meeting was recorded by Klein (PX-10). Somewhat later, in early March, following discussion between Klein and his superior Hugh M. Cleveland, the latter developed a chart detailing the work assignments that would be involved in carrying out the project. (PX-15; T-576-77). In summary, the fabrication sequence involved the following steps:[5]

1. Preparation of a silicon chip. This step, while rather involved and time consuming, is only the preparation of starting materials. It does not relate directly to the invention.

2. Deposition of an insulating layer on the upper surface of the chip. The parties disagree on which insulating materials were initially embraced by the Kerwin group. Without question, silicon nitride was the insulator of choice by those at the February meeting. The contemporaneous evidence, however, convinces this Court that silicon nitride was not the only insulator considered. Reference to silicon nitride was somewhat equivocable, e. g., Klein's notes (PX-10) in reference to this insulating layer, contains the notation "(Si_3N_4?)" and Cleveland's notes (PX-15) expressly indicate that an alternative to silicon nitride was considered. This alternative insulator was a layer of silicon oxide over the silicon, followed by a layer of silicon nitride. This two layer insulating medium is referred to as a "sandwich". *See* Fig. 1, Appendix.

3. Deposition of a layer of silicon oxide on top of the insulating layer. *See* Fig. 2, Appendix.

4. The selective etching away of the silicon oxide layer from the surface of the chip. This etching was to be effectuated by a so-called photoresist technique. The photoresist technique is used to place a plastic film over a portion

[5] The following enumeration of steps is somewhat arbitrary. Further, the list is not all inclusive; steps of minor relevance to the discussion have been deleted. This fabrication sequence is also found in the Kerwin patent. (PX-1).

of the surface of the device.[6] The plastic film then functions as an etch mask for the subsequent removal of undesired portions of the underlying silicon oxide layer. *See* Fig. 3(A), Appendix. This is possible because certain agents which will dissolve silicon oxide, e. g., ammonium bifluoride, will be unreactive to the plastic film. Further, the ammonium bifluoride will have little effect on the underlying silicon nitride layer—thus in the jargon of the BTL group, the etch process would be "go, no-go"—go as to the silicon oxide and no-go as to the silicon nitride.

The remaining portions of the photoresist material are then removed. *See* Fig. 3(B), Appendix.

5. Deposition of a silicon layer across the entire surface. *See* Fig. 4, Appendix.

6. Placement of a plastic film by photoresist procedure over selected portions of the silicon layer, followed by etching away of a portion of the silicon layer with a mixture of hydrofluoric, nitric and acetic acids saturated with iodine. This mixture has little effect on the layers underlying the silicon. Subsequently the plastic film is removed by suitable solvent. *See* Fig. 5, Appendix.

7. Removal of exposed silicon oxide by use of ammonium bifluoride which will remove exposed SiO_2 but have little effect on silicon or silicon nitride. *See* Fig. 6, Appendix.

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[6] This technique, old in the art, involves coating the entire surface of the chip with a plastic material having photochemical properties. A photographic "mask" containing appropriate appertures could then be placed over the surface. The masked chip is then exposed to light, the light being allowed to strike only those areas of the chip on which it is desired to have the plastic film remain. Following exposure to light, the unexposed portions of the plastic film are removed with an appropriate organic solvent, with the exposed portions of the plastic film remaining intact.

8. Removal of the silicon nitride layer by use of hot phosphoric acid, a solvent to which the underlying silicon or, in the case of the sandwich, silicon oxide, is impervious. In the case of the sandwich, underlying silicon oxide must then also be removed, again using ammonium bifluoride. In these etch steps, the silicon gate functions as an etch mask over the underlying insulator. These etch steps are followed by the diffusion or "doping" step, which results in formation of the source and drain electrodes. During this latter procedure, the silicon gate acts as a diffusion mask. *See* Fig. 7.

9. Metallization. This step involves placement of metal on the electrode surface. This is required in order to facilitate attachment of wires to the device.

Following the February meeting, BTL investigators immediately began to try to produce field effect transistors using the newly devised fabrication sequence. Many of the individual steps in the process, however, were time-consuming, though routine. Accordingly, the first semi-completed devices were not tested until late May or early June of 1966. The devices which were then tested employed a single silicon nitride layer, and not the sandwich, as a gate insulator. Further, these devices were not "metallized". That is, the devices did not have metal covering the electrode surfaces for the attachment of wire leads. Accordingly, the devices were tested using a so-called probe test.

A probe test involves the physical placement of wires against the electrode surfaces—the physical placement being facilitated by holding the device array in a clamp and moving wire probes with a micrometer-like screw down on to the appropriate surface locations. The operator performing the test peers through a microscope while making contact to ascertain that the wires are being held against the desired electrode. (T-194-99).

The late May-early June probe tests of the nitride devices were clearly successful. The tests showed a "transistor effect", i. e., they showed drain-to-source current as a function of drain-to-source voltage for different applied gate voltages, which curves were within a commercially accepted range; and the tests showed this result was true for a high proportion of the devices tested. (PX-24).

After the probe tests were performed, Sarace attempted to metallize the devices. The conventional procedure would have been to use a so-called "aluminization" process. The parties agree that such a process would have been routine and its effectuation would have been within the purview of one of ordinary skill in the art.[7] Sarace, however, elected to perform a "platinization" procedure.[8] This procedure was somewhat experimental but was also a more rapid and convenient procedure. (T-81, 151).[9] Unfortunately for

[7] Although Dietrich A. Jenny, testifying for Hughes, agreed that the process itself would have been routine, he testified, in effect, that the outcome could not have been predicted with certainty. (T-880-81, 888).

[8] Sarace did not actually perform the platinization step himself. That procedure was performed by others at BTL at his request. (See DX-16 at 16; T-691-92). Similarly, an aluminization would have been performed by others. (T-174).

[9] The platinization procedure in essence involved the vacuum deposition of metallic platinum over the surface of the device followed by a heat treatment. The heat would convert any platinum over silicon into platinum silicide, a conductor. Following this formation of platinum silicide over exposed silicon, the wafer could be washed with acqua regia to remove unreacted platinum. (T-79-81, 347-48). In contrast, an aluminization procedure would be more time consuming for it would involve photolithographic masking operations.

Sarace, the platinization procedure, which was performed in late June 1966, produced only "shorted" devices. (PX 16 at 56; T-741-42).

Up until this time, work on the silicon gate project had required the efforts of several individuals. From this time on, however, Sarace was the only BTL employee to be assigned essentially full time to the project. (T-703, 732, 788). Following the failure with platinization, Sarace did not immediately switch to a conventional metallization procedure. Rather, he performed a microscopic examination of the shorted device in an effort to determine the source of the shorts. This examination failed to reveal the source of the shorts, but it did disclose an over-etching step. (PX-16 at 56). Although this over-etching had apparently not been exemplified in prior tests of the electrical characteristics of the devices, Sarace proceeded with a series of tests aimed at developing more precise etching-step parameters. This phase of Sarace's work continued into August of 1966. In addition, Sarace worked on several other problems affecting the devices.[10]

During the course of his work on these problems, Sarace became aware of a further problem, a hysterisis effect on the devices having a silicon-to-silicon nitride interface.[11]

[10] These problems included, *inter alia:* (1) overly high "P-channel thresholds" initially thought to be caused by improper cleaning techniques, but which were solved by use of a hydrogen anneal (T-710-11); and (2) the failure of the photoresist material to adhere properly to silicon. (T-709).

[11] Sarace explored this hysterisis effect using capacitors rather than S.G.F.E.T.'s as a test vehicle. This was because capacitors containing a silicon-to-silicon nitride interface were easier to fabricate than were S.G.F.E.T.'s, and tests of the electrical properties of such capacitors could be extrapolated to S.G.F.E.T.'s (T-712, 773-74).

Hysterisis can be considered a type of electrical instability.[12] While hysterisis did not make these devices totally unsatisfactory, it was a deficiency which it was desirable to overcome. Accordingly, Sarace directed his efforts to overcoming the hysterisis problem. A solution to the hysterisis problem was somewhat elusive. Sarace's notebook (PX-16) indicates that up until October 17, 1966 no solution to the hysterisis problem had been found.

There are no entries from October 17, 1966 until January 17, 1967 in the laboratory notebook of Sarace, the only BTL employee then devoting full time to the S.G.F.E.T. project. The activities at BTL during this period are not recorded on a day-to-day basis and, therefore, must be gleaned from (1) the testimony of Sarace and others;[13] and (2) certain other supporting documents. The earliest dated documents showing a solution to the hysterisis problem are in form of viewgraph slides (PX-42) which were prepared in conjunction with a talk that Sarace gave at a meeting with another group of BTL workers in Allentown, Pennsylvania. This meeting was held December 9, 1966 (T-793), and the viewgraphs were presumably prepared shortly before that date. These viewgraphs slides show

---

[12] The hysterisis was exemplified by a displacement in plots of gate capacity vs. gate voltage which was observed when a plot that had been made while increasing voltages was compared with a plot made immediately thereafter, while decreasing voltages. *See,* e. g., PX-42 at 7.

[13] Klein testified to contact with Sarace during the period in which Sarace was the only BTL inventor working full time on the silicon gate project. (T-166, 174). There was also testimony by other workers at BTL who had some minor recollection of contact with Sarace in connection with the S.G.F.E.T. project in the fall of 1966. *See, e. g.,* testimony of Roger Edwards. (T-503D-504).

that sometime prior to December 9, Sarace had employed the so-called "sandwich" construction and that this construction had resulted in elimination of the hysterisis problem.

Another document which supports a November date of completion for a S.G.F.E.T. utilizing the sandwich construction is a memorandum dated January 5, 1967 (PX-48) sent from Mr. Biondi, the director of the electron device laboratory, to Mr. Cave of the BTL Patent Department. Although the memorandum is over Mr. Biondi's signature, it was actually written by Kerwin. (T-326). This memorandum indicates that subsequent to a prior memorandum dated November 15, 1966 (PX-35), the "sandwich" process was employed; that the sandwich process improved electrical stability; and that sandwich-containing devices were undergoing life tests.

In life tests, the devices are subject to stress conditions, e. g., elevated temperatures, and periodically data is gathered from the devices to check for changing electrical characteristics; that is, the devices are placed in a furnace and removed at given intervals for electrical testing, then returned to the furnace for a further time interval. These life tests are used to indicate the "stability" and "reliability" of the devices. (T-152, 321-22). Also they would show whether a device would "last long enough to be useful". (T-231). These tests required, as a practical matter, that the devices first be metallized. (T-152, 714).

Not until January 1967 did the Patent Department at BTL commence preparation of a patent application directed to the Kerwin invention. The application was filed March 27, 1967.

The Existence Of An Interference.

Although Hughes at one time acceded to BTL's position that an interference existed, the Court expressed reluctance to accept a stipulation on this question. Since the question of whether an interference exists may, in a § 291 suit, be characterized as going to the Court's subject matter jurisdiction, the Court deemed it inappropriate for the parties to stipulate to the matter. The Court asked the parties to address themselves anew to the question of the existence of an interference in their post-trial briefs.

Hughes again contends that no interference exists, but the Court is of the view that the evidence in the record unequivocally supports the existence of an interference. As this Court noted in denying Hughes' dismissal motion, the allegedly interfering claims of the Dill and the Kerwin patents differ in only one respect—the process claimed in the Dill patent recites a step of "etching away the exposed portions of said insulating layer", while the corresponding step in the Kerwin patent reads "etching away the exposed portions of said insulating layer *using said silicon layer as a mask*". (emphasis added). See 185 U.S.P.Q. at 661.

However, in Dill's original Invention Disclosure which he submitted to the Hughes' Patent Department, he referred to the use of the "Si layer as a mask". (Pretrial Order ¶27). Further, the parties agree that Dill correctly testified before this Court in the *Hughes* v. *General Instruments* trial that his invention did not require a separate masking step and that those skilled in the art would recognize that the silicon gate itself acted as an etch mask. (Pretrial Order ¶33). Thus, this Court is satisfied that Claim 1 of the BTL patent and Claim 5 of the Hughes patent are, in fact, interfering.

After trial, Hughes advanced two additional arguments in support of the view that the patents were not interfering. First, Hughes contended that if the Dill process were modified to include the deposition of metal on top of the silicon gate, then that metal, and not the silicon, would act as an etch mask. There is no testimony or suggestion in the record, however, that indicates the Dill process has never been so practiced. Further, it is not evident to this Court that even if the process were so practiced that the metal would perform as the mask to the exclusion of the underlying silicon. Second, Hughes contended that the use of silicon as an etch mask in the Kerwin process refers to the use of silicon as a mask for the field oxide layer, which layer is lacking in the Dill process. Again, since the issue was raised after trial, the Court has no testimony in support of this view. However, as this Court understands the Kerwin process, the fact that silicon may act as an etch mask for the field oxide does not diminish the fact that the silicon gate also inevitably serves as an etch mask with respect to the gate insulator. Accordingly, the Court finds that an interference for purposes of § 291 does, in fact, exist.

Conception.

A "conception is the mental part of the process in arriving at invention". *Electro-Metallurgical Co.* v. *Krupp Nirosta Co.*, 122 F.2d 314, 318 (3rd Cir. 1941). Conception is not, however, merely "the perception or realization of the desirability of producing a certain result; rather it is the perception or realization of the means by which the result can be produced." 1 Rivise and Caesar, Interference Law and Practice § 110 (1940). Further, this mental possession of the means must be such that completion or effectuation of the invention requires no more than

routine skill. Accordingly, the need for extensive subsequent research will negate an earlier asserted date of conception. *See Alpert* v. *Slatin,* 305 F.2d 891, 894 (C.C.P.A. 1962). It is clear that at their February 1966 meeting, the BTL group did more than merely recognize a problem. Hughes argues, however, that the February conception was incomplete in that extensive research was required to reduce the February conception to practice. The BTL inventors acknowledged that at the time of the February meeting, they were uncertain of their ability to carry out certain of the process steps envisaged in their conception. *See, e. g.,* T-287. Viewing the events after the fact, however, this Court is convinced that BTL inventors faced no problems in pursuing a reduction to practice which required the use of inventive skill. That is, while it was impossible in February 1966 to state with certainty that the BTL process would work, events would show that the process did work. Further, while the process of reducing the invention to practice was lengthy, this was not primarily the result of extensive experimentation required for a successful reduction to practice. Many of the individual process steps, though old in the art, were quite time consuming. Further, much of the experimentation was directed to solving the hysterisis problem, a problem which in itself would not have precluded a successful reduction to practice.[14] Accordingly, this Court is convinced that BTL has

[14] Hughes also argued that the February conception was deficient in that it did not envisage the use of the sandwich construction, which construction was ultimately used by BTL in their completed devices. As is clear from the discussion of facts *supra,* however, this Court is of the view that the sandwich construction is amply demonstrated in the documents that came out of the February meeting.

met its burden of proof[15] respecting its entitlement to a February-March conception date.

Reduction To Practice.

"A process is said to be reduced to practice when the series of steps constituting the process are carried out in such a manner as to demonstrate the practicability of the process." Rivise & Caesar, *supra,* § 131 (citing *Corona Cord Tire Co.* v. *Dovan Chemical Corp.,* 276 U.S. 358, 48 S.Ct. 380, 72 L.Ed. 610 (1928)). Further, in the case of a product-producing process, a reduction to practice requires the establishment of utility for the products produced by the process. *See, e. g., Tennessee Valley Authority* v. *Monsanto Chemical Co.,* 383 F.2d 973, 977 (5th Cir. 1957). Accordingly, the date of BTL's reduction to practice is the date on which BTL can show that it produced a useful field-effect transistor using the silicon gate process.

BTL contends that such a reduction to practice was shown by the probe tests in the period of late May to early June 1966. Hughes contends that the probe tests involved less than completed devices and, as such, they were insufficient to demonstrate a reduction to practice.[16]

[15] The Kerwin inventors, who filed their application five months after Dill, would be the junior party in the Patent Office and thus have borne the burden of proof. 37 C.F.R. § 1.257. Although it is not clear that the burden should always be so allocated in a § 291 proceeding, where as here the junior party is also plaintiff, this Court has no problem concluding that such party should bear the burden of proof.

[16] It is Hughes' position that a metallized device is a prerequisite to reduction to practice, notwithstanding the fact that the claims of the Kerwin patent do not encompass a metallization step, and that metallization was an established art.

There are a multiplicity of opinions dealing with the question of whether or not a given laboratory or bench test constitutes a reduction to practice in a particular case. *See, e. g.,* Rivise & Caesar, *supra,* § 143 and § 144. The frequently stated rule is that "a test under service conditions is necessary in those cases, and in those only, in which persons qualified in the art would require such a test before they are willing to manufacture and sell the invention, as it stands." *Sinko Tool & Manufacturing Co.* v. *Automatic Devices Corp.,* 157 F.2d 974, 977 (2d Cir. 1946).

While this Court is convinced that the May-June 1966 probe tests constituted a successful intermediate experiment, BTL has failed to establish that those tests demonstrated that the devices possessed the utility required for a reduction to practice. The testimony of BTL's own inventors was that life tests of completed devices were necessary in order to demonstrate that the devices were reliable and useful.[17] These life tests establishing a reduction to practice were not completed until December 1966-January 1967.

Diligence.

Since BTL has established a date of conception prior to Dill's date of conception but has established a date of reduction to practice subsequent to Dill's date of reduction to practice, BTL can prevail only if the Kerwin group is found to have exercised reasonable diligence from just prior to Dill's conception up until their reduction to practice in December 1966-January 1967.

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[17] BTL urges that this Court's opinion in *Hughes Aircraft Co.* v. *General Instruments, Inc.,* 374 F.Supp. 1166, implies that successful, corroborated probe tests of an S.G.F.E.T. will suffice for a reduction to practice. This Court does not, however, read its prior opinion as so holding.

"The party chargeable with diligence must account for the entire period during which diligence is required." *Gould* v. *Schawlow,* 363 F.2d 908, 919 (C.C.P.A. 1966). Further, in making such account, the testimony of the inventor alone is usually deemed insufficient. *Id.* at 919; *Sletzinger* v. *Lincoln,* 410 F.2d 808, 812 (C.C.P.A. 1969).

There is no question that the Kerwin inventors were diligent from the time of their February-March 1966 conception up until the time of the probe tests in May-June 1966. In the second half of 1966, however, Sarace was the only inventor devoting full time to the project and his records show a substantial void, from October 17, 1966 until January 17, 1967. Sarace testified that it was in this period that he returned to the "sandwich" conception, and constructed and tested such a device, though his notes do not reflect this. However, certain other evidence does corroborate Sarace's testimony of full-time efforts on the S.G.F.E.T.

On December 9, Sarace presented viewgraphs with test data from sandwich devices to a meeting at Allentown, and this indicates that BTL workers had completed fabrication of these devices by late November 1966.[18] Further, the January 5, 1967 Biondi memorandum (PX-48) indicates that the time-consuming life tests were then underway.

While a day-to-day corroboration of Sarace's testimony regarding his activity during the fall of 1966 would be desirable, this Court concludes that its absence is not fatal to BTL's case. It is sufficient that BTL has estab-

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[18] Such date would be required in order for Sarace to test the devices and prepare for the December 9 presentation. As indicated by the November 15, 1966 and January 5, 1967 Biondi memorandum (PX-35 and 48), sandwich devices had not been constructed before mid-November 1966.

lished by competent evidence an inference more reasonable than not that work on the silicon gate process continued uninterrupted from prior to Dill's date of conception until completion of the life tests which constituted a reduction to practice. The Court thus finds that BTL has met its burden of proof regarding the exercise of reasonable diligence.[19]

Accordingly, BTL is declared to be prior inventor of that subject matter common to the Dill and Kerwin patents.

Submit order.

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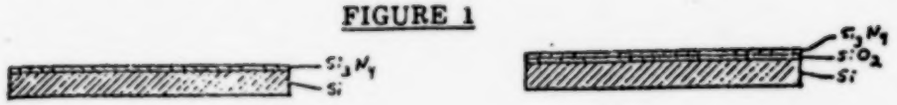
[19] Hughes argued vigorously that the time spent by Sarace pursuing a solution to the hysterisis problem should not be credited toward reasonable diligence. This Court does not agree. Although there is authority in support of the view that diligence respecting one element of a combination is not diligence respecting the use of that element in combination with another, *Riche* v. *Permutit Co.*, 47 F.Supp. 275 (D.Del. 1942), that authority is not applicable here. In this Court's view, the silicon gate process, as it existed in the fall of 1966, cannot be readily subjected to rigid compartmentalization. Accordingly, Sarace's work on problems inhibiting commercial ultilization of the process should be deemed reasonable diligence, whether that work encompassed the whole of the process, one step in the process, or an ultimately abandoned step.

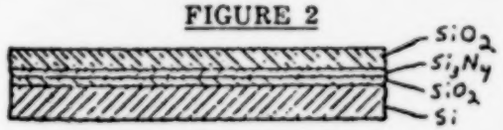
APPENDIX

FIGURE 1



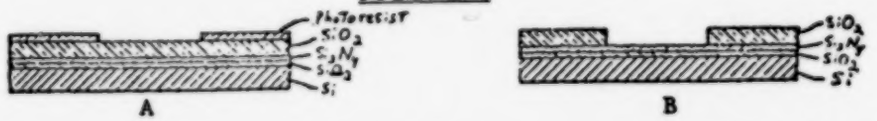
Schematic representation of (A), silicon (Si) chip on which a silicon nitride (Si_3N_4) layer has been deposited and (B), silicon chip on which a silicon oxide (SiO_2) layer has first been deposited, followed by a silicon nitride layer. Figure 1B represents the so-called sandwich construction. It is that construction which is depicted in all of the following figures.

FIGURE 2



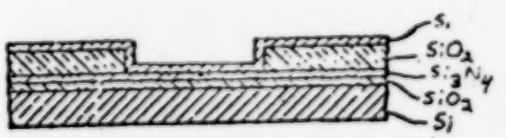
Schematic representation of device following completion of step 3.

FIGURE 3



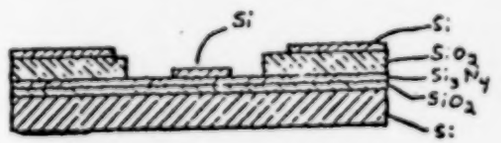
Schematic representation of (A) device following photoresist step and (B) device following etching of SiO_2 and removal of photoresist.

FIGURE 4



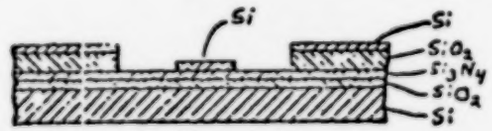
Schematic representation of device following step 5.

FIGURE 5



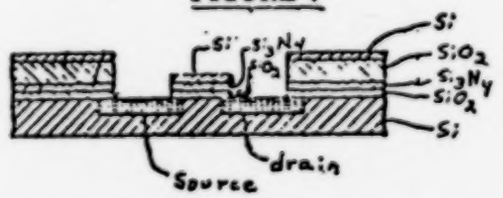
Schematic representation of device following step 6.

FIGURE 6



Schematic representation of device following step 7.

FIGURE 7



Schematic representation of device following step 8.

Supreme Court, U. S.
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In the

Supreme Court of the United States

OCTOBER TERM, 1977

No. 77-1658

JAMES R. CRICCHI,

Petitioner,

vs.

CHARLES T. NABER and GEORGE C. LOCKWOOD,

Respondents.

BRIEF IN OPPOSITION TO PETITION FOR A WRIT OF CERTIORARI

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INTRODUCTION

This is a straightforward patent interference to determine which of the two parties, Cricchi of Westinghouse Electric (Cricchi) or Naber et al. of NCR Corporation (Naber), is the first inventor of an improvement in an already-existing electronic device known as an MNOS transistor. The CCPA found that Cricchi failed to meet his burden of establishing "reasonable diligence" throughout a fifteen-month "critical period" and reversed the

decision of the Board of Patent Interferences awarding priority to Cricchi (App. 7a, 9a).•

The "Questions Presented" in the petition under the untenable guise of decisional conflict and "[u]npredictable vacillations concerning the standard of CCPA review" are founded upon misconstructions of the record and mischaracterizations of the CCPA's holdings. The only issue here is the routine one of whether the CCPA correctly held that the Board of Patent Interferences erred in finding that Cricchi met his burden of proving "reasonable diligence". Such issue of fact needs no further review or resolution by this Court.

• Abbreviations employed:
"P.—" - refers to Cricchi's Petition for a Writ of Certiorari, Page No. —.
"App.—" - refers to the Appendix to Cricchi's Petition for a Writ of Certiorari, Page No. —.
"N.App.—" - refers to Naber's Appendices to this Opposition, Page No. —.

REASONS FOR DENYING THE PETITION

Naber opposes the petition and submits that there are no special and important reasons for granting it. More specifically, the petition should be denied for the following reasons, each of which is briefly discussed hereinafter:

1. The CCPA's decision is manifestly correct.
2. There is no conflict of decisions.
3. There is no departure from the accepted and usual course of judicial proceedings.
4. There is no substantial public interest or question of widespread importance presented; only private interests are at stake.
5. Cricchi is improperly seeking a trial de novo before this Court.

1. THE CCPA'S DECISION IS MANIFESTLY CORRECT

As postured by the decisions below, Cricchi, the junior party, was first to conceive the invention and last to reduce it to practice, the respective dates of the parties being as follows:

Party	Date of Conception	Date of Reduction to Practice	Date of Filing for Patent
Cricchi	10/22/69	9/28/71	1/20/72
Naber	6/70	7/25/70	12/3/70

In this factual context and pursuant to 35 U.S.C. § 102(g), even though Cricchi was first to conceive, he can prevail only if he also establishes "reasonable diligence" from just prior to Naber's conception (6/70) to his own purported reduction to practice (9/28/71), a fifteen-month

critical period. *Hull* v. *Davenport*, 90 F.2d 103 (CCPA 1937); *Morway et al.* v. *Bondi*, 203 F.2d 742 (CCPA 1953).

Cricchi conceded below that he could have reduced the invention to practice when he conceived it (10/22/69). Notwithstanding, he admitted that actual work on the invention did not start until October 1970—a year later and **four months after the critical period started.** The CCPA found that Cricchi failed to satisfy the requirement of "reasonable diligence" during this initial gap of four months and also during the subsequent eleven months of the critical period.

No "Reasonable Diligence" During The Initial Four-Month Period

For his alleged diligence during this initial four-month period, Cricchi relies on research and development (R&D) work directed to improving MNOS fabricating techniques. Cricchi's reliance on this R&D work is ill-founded on two grounds. First, the R&D work, whenever it did occur, did not involve the construction or testing of the device of the counts and is not otherwise linked thereto. Second, Cricchi failed to provide any evidence that any of the R&D work was carried out during the initial four months of the critical period.

To the extent that R&D work did occur, it started long **before** Cricchi conceived the invention and was not completed until long **after** he reduced it to practice. It covered a time span of at least six years (App. 7a). The R&D work was of general applicability to all MNOS devices (App. 7a). Westinghouse had many other MNOS devices under development at the time. No contemporaneous evidence establishes a link between the continuation of the generalized R&D work during the four-month period (if it

occurred) and a reduction to practice of the device at issue, as more fully argued below (*e.g.*, N.App. 20a-21a).

In his petition Cricchi attempts to foster the false scenario that Westinghouse's R&D "work on improving a fabricating technique" was being carried out so that he could manufacture "a satisfactory device embodying the invention" (P. 3). This is attorney argument which is not supported by the record. Cricchi is improperly presenting an early portion of Westinghouse's R&D program of general MNOS applicability as an integral part of a later effort to reduce his particular MNOS invention to practice.

If Cricchi were permitted to fill lapses and gaps in his activity on a particular invention with such generalized R&D work, it would in effect provide Westinghouse with a "'reservoir of 'reasonable diligence'" (App. 7a). The same R&D work could then be used over and over again to establish reasonable diligence on each and every MNOS device which Westinghouse conceived during the six-year period. Cricchi could have done nothing on the invention in issue for six years and still claim that he was reasonably diligent in reducing it to practice.

Cricchi argues in effect that so long as he considers extraneous work necessary to achieve satisfactory commercial goals of his own personal determination, he should be excused from reducing the invention to practice even though he is completely capable of so doing. Implicit in this argument is a subjective standard of reasonable diligence totally determined by the mental attitude of a party. Cricchi's standard is unworkable and untenable, as more fully argued below (*e.g.*, N.App. 22a-24a).

But even if Cricchi were allowed to count generalized R&D work as part of his alleged reasonable diligence, his **record** is devoid of any evidence of any R&D work, general or specific, during the initial four months of the critical period. As proof of continuity of activity during the initial four-month period, Cricchi previously relied solely upon time card records, which bore no description of the underlying work, and his uncorroborated testimony as to the activity covered by the time charges. Otherwise, the evidence adds up to zero, *i.e.*, no documents, no physical exhibits and no testimony of any kind disclosing any specific acts on any specific dates by any specific individuals during the entire four-month period.

As to the time card records, suffice it to say that they were misrepresented below and the CCPA took particular note of the contradictions (App. 7a-9a). They now stand discredited as having any probative value in these proceedings and Cricchi has dropped all reliance thereon before this Court, as he must. Without his time card records during the first four months, Cricchi has no evidence whatsoever of any activity on the R&D program or anything else.

In his petition, Cricchi attempts to foster the impression that the only issue as to this four-month period is whether R&D work of general applicability can properly be counted as part of his diligence story as to a particular invention. Assuming, arguendo, that such work can be counted, Cricchi ignores the fact that he still had the affirmative burden of establishing that at least the R&D work was being carried out with reasonable diligence during that four-month period. On this point the record is devoid of evidence; there is only attorney argument.

In fact, in view of the total lack of such evidence, the issue as to whether R&D work of general applicability in the present factual context can properly be counted towards diligence is moot and need never be reached by this Court.

No "Reasonable Diligence" During The Subsequent Eleven-Month Period

During the subsequent eleven-month period, Cricchi and his associates did perform certain acts which purportedly led to a reduction to practice on September 28, 1971, fourteen months after Naber reduced the invention to practice and almost ten months after Naber filed for patent protection. But there were lengthy lapses and gaps in Cricchi's proofs throughout this period which Naber repeatedly pointed to in the proceedings below and Cricchi steadfastly ignored (*e.g.*, N.App. 18a). Instead, Cricchi papered them over with his time card records, i.e., Cricchi Exhibit 100, to create a facade of reasonably continuous activity. The Board's decision in his favor was bottomed on this misleading facade (App. 22a).

After the CCPA found that the time card records were not what they were represented to be (App. 8a), Cricchi abandoned any reliance thereon and adopted a new approach. In his petition for rehearing before the CCPA, he contended for the first time that at least during the subsequent eleven-month period ". . . Reasonable Diligence . . . is Shown Independent of Time Cards . . ." (N. App. 2a). Rehearing denied, he now attempts to fault the CCPA for failing to have independently examined the record and discovered and developed such new approach ab initio. A litigant can not impose such burden on a court. In reversing the Court of Appeals for the Seventh Circuit, in *Farmer's Guide Co.* v. *Prairie Co.*, 293 U.S. 268

(1934), this Court noted that the respondents had the opportunity to show that the decision below was otherwise right and should be affirmed, although originally given on untenable grounds. This the respondents failed to do and the Court disavowed itself of any obligation to do so, stating (p. 281):

> ". . . we will not examine the record to discover grounds to sustain it. . . ."

Moreover, a careful consideration of the record in the light of Cricchi's new approach reveals that even his new approach is fatally deficient in establishing reasonable diligence. This is apparent from consideration of Cricchi's petition for rehearing before the CCPA (N.App. 1a-14a) and Naber's response thereto (N.App. 15a-25a). Quite properly, the CCPA found that Cricchi had not satisfied his burden of proving "reasonable diligence" during the subsequent eleven-month period also.

2. THERE IS NO CONFLICT OF DECISIONS

Cricchi seeks to conjure up a conflict between the CCPA's decision and the decisions of other Circuits and its own precedents. The alleged conflicts are based on mischaracterizing the CCPA's holdings in this case and ignoring important factual distinctions.

For example, Cricchi represents that the CCPA has here ruled that R&D work did not "qualify as 'reasonable diligence' because it was 'needed to produce a commercially acceptable device. . . .' (App. 7a)" (P. 12), and that "work directed to a 'commercially-acceptable device' does not constitute diligence (App. 7a)" (P. 14). He thus seemingly creates an "irreconcilable conflict" with other decisions, particularly that of the Third Circuit in

Bell Telephone Laboratories v. *Hughes Aircraft Co.*, 564 F.2d 654 (3 Cir. 1977), affirming 422 F.Supp. 372 (D.Del. 1976), *cert. denied* 197 USPQ 448 (March 20, 1978).

But a fair reading of the CCPA decision herein (App. 1a-9a) reveals that Cricchi is presenting portions of it out of context and that **the CCPA made no such rulings**. Instead, it held that in the present factual context R&D work at Westinghouse which was "generally applicable to all MNOS devices did not satisfy the requirement of 'reasonable diligence' on the part of Cricchi" (App. 7a).

"Reasonable diligence" is largely a fact issue and the decisions turn upon their own respective facts. In *Bell,* for example, the invention related to a process for making a semi-conductor device, not the device itself, as here. Unlike the present case, the Bell inventors commenced actually reducing the invention to practice immediately after conception. They constructed the device by the claimed process but encountered certain problems in so doing. They then directed their attention to solving these problems and the Court found that these efforts constituted part of Bell's reasonable diligence. It was a continuous effort from start to finish.

In contrast, Cricchi's situation represents an after-the-fact attempt to present a portion of an R&D program of general applicability as an integral part of a belated effort to reduce a particular invention to practice. The R&D work could not have been an outgrowth of the effort to reduce Cricchi's invention to practice. It was started almost a year before conception.

Whether in the light of the particular facts of *Bell* the Third Circuit decision in that case is correct is not rele-

vant here. The facts are very significantly different. No conflict as to the law, however, has been established. The only **apparent** conflict between *Bell* and the present case arises from Cricchi's misconstruction of the CCPA's holdings herein.

Cricchi cites four cases to support the argument that the Court of Appeals for the District of Columbia subscribes to a rule diametrically opposed to that adopted in the present case, *i.e., Woods* v. *Poor,* 29 App. D.C. 397 (1908), *Kitchen* v. *Smith,* 39 App. D.C. 500, 502 (1913), *Sargent* v. *Vetter,* 48 App. D.C. 582 (1919), and *Abbott* v. *Shepherd,* 135 F.2d 769, 770 (D.C. App. 1942). But taking into consideration the important factual distinctions, the CCPA decision herein is completely reconcilable with these cases.

Cricchi asserts that the CCPA's present decision goes beyond the precedents cited by the CCPA. He fails, however, to particularize his assertion. Naber submits that taking into consideration the important factual distinctions, the present decision is fully in harmony with these precedents.

Cricchi also broadly asserts that the CCPA's present decision "conflicts with at least some CCPA decisions", *i.e., Clancy* v. *De Jahn,* 36 F.2d 131 (CCPA 1929), *Watkins* v. *Wakefield,* 443 F.2d 1207, 1209, 1210 (CCPA 1971), and *Reinhart* v. *Coursen,* 458 F.2d 516 (CCPA 1972). Cricchi also fails to particularize this assertion. Again, Naber submits that taking into consideration the important factual distinctions, the present decision is fully reconcilable with these cases also.

3. THERE IS NO DEPARTURE FROM THE ACCEPTED AND USUAL COURSE OF JUDICIAL PROCEEDINGS

Cricchi suggests,

> ". . . that the CCPA no longer considers itself bound by the accepted and usual standards of judicial review." (P. 19)

Cricchi's contention is based on the allegation that once the CCPA stripped away Cricchi's discredited time charge records, on which Cricchi had previously relied to establish continuity of effort, it disregarded the Board's summary of testimony supporting the holding of diligence. But the Board's decision was predicated on the "reasonably continuous activity" apparently (but not actually) established by Cricchi's since-discredited time charge records, i.e., Cricchi Exhibit 100 (App. 22a). Without the time charge records, the Board itself could not have found that Cricchi was reasonably diligent.

It should also be recognized that the five-judge bench of the CCPA is in just as good a position to review a record as a three-member board of an administrative tribunal. The Rules of Practice of the Patent and Trademark Office do not provide for the appearance of live witnesses before the Board of Patent Interferences, and none did appear. Thus the Board, as well as the CCPA, evaluated the testimony of witnesses, based upon transcripts thereof.

This is not a situation wherein the admonition of Rule 52(a), Fed.R.Civ.P., that "due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses" is applicable. The CCPA had exactly the same record before it as the Board. Upon review of

that record it became manifest to the CCPA that the decision of the Board was clearly erroneous.

4. THERE IS NO SUBSTANTIAL PUBLIC INTEREST OR QUESTION OF WIDESPREAD IMPORTANCE PRESENTED; ONLY PRIVATE INTERESTS ARE AT STAKE

This is a routine patent dispute between two parties as to who is the first inventor as to certain subject matter. It is not a question of whether a patent should issue but, rather, who should own it. There is no significant public interest at stake and Cricchi does not allege any.

In fact, to a minor degree the public interest is best served by the present disposition of the litigation. The dispute involves Naber's patent, which issued March 6, 1973, and Cricchi's pending application. The Naber patent will expire in less than twelve years. If this Court were to reverse, Cricchi's application would issue as a patent at some future date and would not expire until seventeen years thereafter. This would impose upon the public domain a much longer period of exclusion.

5. CRICCHI IMPROPERLY SEEKS A TRIAL DE NOVO BEFORE THIS COURT

Cricchi is, in effect, seeking a trial de novo of his new approach before this Court, his old approach being based upon the discredited time charge records to establish reasonable continuity of effort. This is evident from a comparison of his briefs below and his present petition. While space limitations prevent such comparison herein, suffice it for the present to consider only one illustration.

In his petition Cricchi calls particular attention to two physical exhibits, CX III-1 and CX III-2 (P. 7, 21). He

singles out these two exhibits and characterizes them as being "particularly important" (P. 7). In his six briefs below*, however, CX III-1 was never mentioned and CX III-2 was mentioned only once—and that passing mention occurred in Cricchi's recent petition for rehearing before the CCPA (N. App. 4a).

Despite the unwarranted allegations of decisional conflict and departures from the customary standard of judicial review, the petition actually seeks review of Cricchi's new approach to a record fatally lacking in probative evidence of "reasonable diligence" in the hope that this Court might possibly reach a different conclusion. As stated in *Magnum Co.* v. *Coty*, 262 U.S. 159, 163 (1923):

> ". . . The jurisdiction [of the Supreme Court to review cases by way of certiorari] was not conferred upon this Court merely to give the defeated party . . . another hearing. . . ."

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* The six "briefs" are as follows: "Final Hearing Brief on Behalf of the Party Cricchi", September 25, 1975; "Reply Brief on Behalf of the Party Cricchi", December 18, 1975; "Response to Naber et al Petition for Reconsideration", October 13, 1976; Cricchi's "Response to the Rejoinder Brief by Naber et al", November 3, 1976; "Brief for Appellee", August 11, 1977; and "Petition for Rehearing on Behalf of Appellee Cricchi", January 24, 1978.

CONCLUSION

The petition presents no special and important reasons why a writ should issue. Cricchi has not demonstrated that this case involves any of the considerations governing review on certiorari as contemplated in Supreme Court Rule 19, despite the strained efforts to give such appearance. The petition should be denied.

Respectfully submitted,

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June 15, 1978

Appendices

APPENDIX A

UNITED STATES COURT OF CUSTOMS
AND PATENT APPEALS

PATENT APPEAL NO. 77-556

CHARLES T. NABER and GEORGE C. LOCKWOOD,
Appellants,

vs.

JAMES R. CRICCHI,
Appellee.

PETITION FOR REHEARING ON BEHALF OF APPELLEE CRICCHI

This petition is filed to enable the Court to reconsider its Decision* of December 22, 1977 and to affirm the Board's priority award to Cricchi. This Court held that (1) the layer deposition technique work was not "required" in order to reduce the invention to practice because it was not "directly related to" a reduction to practice of the invention (D 5, 6, 10) and (2) the time cards and Cricchi's testimony about the work done toward the completion of the "834" projects from October 1970 to September 1971 was uncorroborated (D 11).

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* Hereinafter referred to as "Decision" or "D" followed by a page number.

It is respectfully submitted that the Decision failed to consider and is in conflict with controlling authorities with respect to the first of its holdings (D 6-10), and that the second holding (D 10-12) misapprehends a massive and well-corroborated record of diligence.

A. Contrary to Holding No. 2, Reasonable Diligence During the Period from October 1970 to September 1971 is Shown Independent of Time Cards and Cricchi's Testimony Relating to Time Cards

The following is a summary of the work leading to the reduction to practice of the invention in the 893 metering subsystem chips on September 28, 1971 (Space limitations do not permit a detailed, discursive presentation of the facts):

10/23/70 Mask set number 834 entered in log book (CX18; R593). Spicer started work on 834 mask set within "a day or two" (R575 of 10/23/70; normally took him 10 weeks (R564) to complete his work on mask (steps 1-4 on CX101; R576). Lancaster testified *May 1 date for completion of the 834 mask making process was reasonable* (R600).

11/30/70-4/21/71 Britton ordered parts for the Breadboard of the metering subsystem (CX2, 4, 5, 6, 7, 8, 9, R392-404).

1/10/71 Lancaster's job summary 1/10/71 (CX17) shows 834 mask set was at step 6 (CX101; R596).

1/25/71 Lancaster (R601) filled out instruction sheets for step 8 of the 834 mask making process (CX21, 22). Step 8 had not been completed at that time. Estimated step 8 in the 834 set process completed on Feb. 11, 1971 (R596).

3/1/71 Cricchi prepared block and wiring diagrams for metering system breadboard (CX24, 25; R235, 236).

3/2/71 Lancaster made diagram (CX27) of test pattern on 834 wafer (R602); before step 9 of process (CX101, R603).

3/9/71 Request for revisions in 834 mask set (CX29).

3/15/71 Lancaster filled out correlation form (CX30) for 834 mask set and prepared CX31 list (R605).

3/19/71 Spicer initialed instruction sheet (CX34) for operator of reduction camera (R565) re 834 mask series.

3/24/71-6/28/71 Westinghouse Mask Inspection Log CX 106 shows masks of the 834 series were inspected in 1971 on 3/24; 4/12, 14, 15, 16, 19, 20, 22 and 28; 5/5, 6 and 6/16, 28.

3/29/71 Cricchi completed Electrical Test Specification for Metering Subsystem (CX40).

4/6/71 Lancaster prepared list of test pattern levels for 834 (CX36).

4/8/71 Ames made entries in his contact printing log book (R610; 664-666; CX20, 38) on 4/8, 12, 13, 14, 15 and 20, 1971 relative to his work on submaster and final working plates in 834 mask series.

5/5/71-5/11/71 Ruehling identified CX42 as being the first 834 process sheet (R455, 488-499) which was used in fabricating the first lot of 834 memory arrays from the 834 mask set.

5/12/71-5/13/71 Cricchi prepared layout drawings for metering subsystem (CX39, 41).

5/14/71 Cricchi prepared Progress Report #2 (CX35) on metering subsystem.

5/28/71 Cricchi performed tests on 834 memory array (CX59).

6/3/71-6/9/71 Ruehling and Cricchi performed tests on 834 wafers (CX45, 67).

6/10/71 Ruehling made process run sheet (CX47) for second lot of 834 wafers (R464).

6/12/71-7/11/71 Cricchi made layouts (CX48, 49, 54, 55, 56) for metering subsystem. Spicer confirmed drawings given to him by Cricchi "to generate a mask set" for 893 (R568).

7/7/71 Cricchi wrote to Britton (CX1) enclosing 10 of the 834 arrays "for your 10 stage breadboard." Britton confirmed receipt of 834's (R416).

7/7/71 Britton worked on 893 breadboard (CXIII-2) until middle of August (R418-19).

8/5/71 Lancaster's log book entry for 893 mask set is between 6/21/71 and 8/5/71 (R609).

8/15/71 After Britton completed his breadboard (middle of August) he completed construction of the chip tester used to test the 893 metering system chips (R419, 441-445). Confirmed by Cricchi trip report (CX11) which states "The purpose of this trip was to deliver and test Metering Subsystems prototypes using the Subsystem Tester built by J. Britton."

8/20/71 By 8/20/71 the photographic masks for the 893 chip were complete (R261-62, CX61).

8/31/71-10/1/71 Log CX106 shows masks of the 893 series were inspected in 1971 on 8/31; 9/1, 2, 3, 9, 10, 14, 15, 17, 20, 21, 22, 24, 27 and 30; and 10/1.

9/71 In September Cricchi made measurements on the 893 metering subsystem chips Lot 01 (R263, CX65).

9/2/71 Cricchi identified (R263) the sixth level mask (CX 66) of the 893 mask set, dated 9/2/71, as containing instructions for the Inspection Department.

9/7/71 Ruehling conducted tests on the 834 (R466, 467) and prepared test curves (CX67).

9/28/71 Britton confirmed (R423-425) tests by Cricchi in Raleigh on the metering subsystem prototype chips, i.e. Cricchi's reduction to practice.

The above summary clearly shows that Cricchi did present "documentary evidence showing specific acts at specific times" (D 11) in the time period October 1970 to September 1971.

B. Holding No. 1 is Contrary to Established Law

I. Pertinent Precedents

35 USC §102(g) speaks of "reasonable diligence" without mentioning the objective of such diligence. However, it is well accepted that the objective must be the same as that referred to in predecessor statutes, namely, "diligence in adapting and perfecting the [invention] . . ." Federico, "Commentary on the New Patent Act," 35 US CA pp. 55, 56. The statutory policy of rewarding an inventor for diligence in "adapting and perfecting" his invention is defeated by penalizing Cricchi for not immediately reducing to practice a "laboratory curiosity" (R 358). As held in *Saurer* v. *Groebli,* 1917 C.D. 160, 162, 45

App. D.C. 298 (1916) "an inventor is to be commended, rather than criticized, for fully perfecting the details of his invention before filing an application, and [acting] . . . in good faith in perfecting it . . ."

The object of diligence must be a concrete reduction to practice which is tested to the inventor's satisfaction, under actual or simulated working conditions, in its intended environment. There can be no reduction to practice unless the test results are "satisfactory" to the experimenter, *James* v. *Clayton,* 90 F. 2d 337, 339 (CCPA 1937). The inventor must so test his product "as to bring conviction at least to him that the product has utility within the meaning of the patent laws and is of such value as to warrant a patent grant," *Muskat* v. *Schmelkes,* 140 F. 2d 984, 989 (CCPA 1944). A "mere model or experiment" will not suffice for reduction to practice, *Birmingham* v. *Randall,* 171 F. 2d 957, 959 (CCPA 1949). Subjective judgment being crucial for a successful reduction to practice, it must be even more crucial and removed from second guessing in the selection of the path toward reduction to practice. The pertinent law was well summarized in Kreek, "Proof of Priority of Invention in Patent Interferences," 35 JPOS 551, 559, 560 (1953):

> "The degree and character of testing depend on many circumstances such as the ultimate use to which the device is to be put, whether or not it is in the nature of a safety device, its complexity, etc. In many instances tests under actual service conditions are required." [Footnote omitted]
>
> "In any event, if the inventor is not satisfied with the performance of the device as a result of test, it can scarcely be held to have been reduced to practice. Sometimes this may work to the disadvantage of one who has designed a device for a use requiring a high degree of accuracy whereas his opponent may have only sought an ordinary use. Even if the device which was designed for the accurate duty would have performed satisfactorily in the less exacting situation, if the device was never tested in the less accurate use, the unsuccessful testing under the more rigid condition would not be sufficient to establish a reduction to practice." [Footnote omitted]

Alleged diligence consequently must be evaluated in the context of the objectives the inventor intended to achieve and by reference to the environment in which his invention was intended to function. Intended objectives and environment are crucial, even if they are not reflected in the issue counts. Thus in *Reinhart* v. *Coursen,* 458 F. 2d 516 (CCPA 1972), neither the parent application nor the issue count mentioned the aging properties of the product invented. Nevertheless, the inventor's inactivity during the product's aging period prior to testing did not negate diligence because "it was reasonable to age the compositions before testing them" 458 F. 2d p. 520.

An inventor may decide to reduce his invention to practice as part of a new plant or a new commercial oil drilling operation, *Clancy* v. *DeJahn,* 36 F. 2d 131 (CC PA 1929), *Watkins* v. *Wakefield,* 443 F. 2d 1207 (CCPA 1971). In such cases the entire construction time of the plant or the oil well counts toward diligence. That is so even though a noncommercial reduction to practice could have been achieved and tested earlier. As stated in the *Watkins* case, 443 F.2d pp. 1209, 1210:

> ". . . we have not lost sight of the fact that the period in question spans more than three months (apparently a rather long time if nothing more than

the relative simplicity of the involved device is considered), nor have we ignored appellants' burden in this proceeding as those who have copied claims from a patent. It is also true, of course, as argued by appellee, that the three-component assembly *could* have been tested earlier on a simulated wellhead. On the other hand, *the involved device was conceived and designed to be used in a rather unique environment as an element of a large and complex installation. That circumstance, in our opinion, constitutes ample justification for foregoing such a test in favor of the far more meaningful procedure of testing the assembly under actual operating conditions.*

"We are satisfied from the record that the Shell Company, appellants' assignee, was diligent throughout the aforementioned period in carrying out the plans for drilling the Naples State 101 well. We are further left with no reason to doubt that the contractor was similarly diligent during that time in completing the equipment to be provided for that operation. [Second emphasis added]

In *Bell Telephone Labs.* v. *Hughes Aircraft Co.*, 191 USPQ 23, 27, 30 (D. Del. 1976)* diligence was found even though the inventor spent much time on a metallization step which was not included in the counts and elected to substitute an experimental metallizing step for a conventional step in the production of silicon-gate field effect transistors. The court specifically pointed out that (p. 31) "work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence . . ."

According to the foregoing authorities, diligence depends upon the objectives, properties and environment

* Hereinafter referred to as the "BTL" case.

which the inventor reasonably envisioned for his invention, regardless of whether all of them are expressed in the issue counts. None of the foregoing authorities were cited in the Decision or in the briefs before this Court. The precedents cited in the Decision do not detract from the above-mentioned legal principles and are rather remote from the present facts as will be shown on pages 9-12 below. The Court's observation (D 7 note 3) that Cricchi could be diligent without attempting to build the simplest device embodying the structure of the counts recognizes the above-mentioned legal principles to an extent which petitioner respectfully submits is far too limited. Petitioner contends that holding No. 1 cannot fairly be reconciled with the above-discussed precedents.

II. The Layer Deposition Technique Work was Necessary to Achieve the Inventor's Objectives.

The Court's holding that improvements in the layer deposition technique practiced at Westinghouse do not count toward diligence completely overlooks the inventor's objectives. The design goals included fast read/write characteristics, resistance to degradation under continual read/write cycling and building a nonvolatile array or matrix of memory devices to test the interaction between devices in the matrix (R359-361, 898).

Devices made by Westinghouse before June 1970 had read/write characteristics one thousand times slower than the objective (CX12-R905)*.

* 100 microsecond pulse (R905 vs. 100 nanosecond pulse (R898).

Layer deposition techniques known at Westinghouse before June 1970 yielded transistors afflicted with severe degradation (R351, 415, CX73). This fact is not refuted by the statement that an earlier Westinghouse device (D 10) operated for "greater than 1000 hours" when "under operating bias" (R905), i.e., with power applied to the device. This statement tells nothing about the operation of that device as a nonvolatile memory, i.e., retention of memory when power is removed from the device, nor does it indicate that the earlier Westinghouse device was capable of continuous read/write cycling without severe degradation. The earlier Westinghouse devices would take continuous read/write cycling at 2Khz for no more than 15 minutes (R415, 416).

The inadequacy of Westinghouse layer deposition techniques in 1969 is beyond dispute. Dr. Kendall, Naber's supervisor, who examined Westinghouse devices "right up to the end of 1969" stated that at that time Westinghouse had not solved "the problem of getting nitride layers of the right electrical conductivity" without which solution you could only make devices "which last for a few hours" (R818-820). He also stated that only after Naber's assignee, NCR, had spent "a year in preliminary research" on "nitride and oxide coatings" was NCR able to make "commercially useable devices" (R820). Plainly it was imperative that Westinghouse catch up with NCR's layer deposition technique which had been perfected at NCR before Naber entered the field.

The testimony of the inventor and his collaborators about development work "necessary" for a "useful device" (R342); about an understanding of such elements of the issue counts as "the nitride thick oxide, and the

nitride thin oxide" structures (R275); and about work required for "the very fast write characteristics . . . we had in mind" (R306) must all be understood with reference to the initial objectives and intended environment and application of the invention.

The steps taken to achieve these objectives between June and October of 1970 were entirely reasonable and included building and testing relatively inexpensive "very simple capacitor structures" (R373); and building separate thick oxide and thin oxide structures and evaluating "them separately" with respect to "tunneling" (R226) in order to "understand the characteristics of each individual element of the structure first" (R272). Projects were undertaken to determine characteristics of both the oxide and nitride layers which resulted in significant conclusions "on the rate and the temperatures of deposition of both oxide and nitride" (R367, 368).

Such development and testing of oxide and nitride layers, which are elements of the counts, capacitor structures and "intermediate work" (R368) should count toward diligence.*

The decision to build an array of memory elements rather than an individual device was also reasonable. Dr. Corak, Cricchi's supervisor, in testifying about the reasons for building an array, stated "We want to test how it operates, what its interactions are with not just a single device, but with other devices of the same type and from our previous experience with Cmos devices, we know that these interactions existed," (R359, 360, see also R373). Naber's first conception document (R883) proposed the

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* BTL case p. 28 note 11 and p. 30.

invention to cure the problem of "drain-substrate breakdown of the 16x16 arrays." According to Cricchi's application (R14) the invention is "particularly suitable for use in parallel memory arrays" because it operates only in "the enhancement mode" (see also R16 lines 3-8).

When the foregoing facts are considered, the spectre of a virtually inexhaustible "reservoir of 'reasonable diligence' " (D 9) disappears. The layer deposition technique work which involved elements of the counts, is relied on only for the first few months of the critical period. Whether layer deposition work done at Westinghouse after October 1970 was reasonable diligence with respect to the present invention is simply not in issue and should not now be decided in the abstract. The fact that the assignees of both Naber and Cricchi had spent a year to improve their respective layer deposition techniques before reduction to practice commenced is the most persuasive evidence of the reasonableness of such work. Petitioner submits that this Court should not brand as "unreasonable" Cricchi's layer deposition technique work between June and October of 1970 merely because the Court is not persuaded by the present record that the extension of such work into 1975 would be reasonable for purposes of the present invention.

III. The Authorities Cited in the Decision are Not Pertinent.

In view of the foregoing facts, the outcome of this interference should be governed by the cases cited (pp. 5 to 8 above) and not by the authorities referred to on pages 6-9 of the Decision. Cricchi did not fritter away his time by trying to improve a commercially available element to be used in combination with the invention as in the *Gunn* case. Westinghouse employees responsible for reducing

the invention to practice did not work mostly on *other* developments as in the *Anderson* case. Their activities were not related to a design not covered by the interference count as in the *Martin* case, insofar as the layer deposition technique needed improvement before there could be a reasonable expectation that the invention would achieve the inventor's objectives and function satisfactorily in its intended environment, namely, a memory array. Westinghouse did not delay its work to prepare a cost estimate as in the *Moore* case. Its work on layer deposition techniques contributed toward embodying the invention in a form which would achieve the intended level of performance and make it useful in the intended environment in contrast to the *Thompson* case in which the inventor tried to perfect an independent element of a combination while failing to test the element defined in the count. Nor is the present case analogous to the *Lichtfield* case in which the drug covered by the issue count was not tested in vivo, while other drugs were so tested. *Goodrich* found a reduction to practice even though further tests were required before the invention could be put into commercial production. That holding does not compel a finding of lack of diligence where the inventor was continuously engaged in development work which he reasonably regarded as necessary for an adequate reduction to practice.

The policy of encouraging the inventor to work toward "perfecting . . . his invention" *Saurer* v. *Groebli,* 1917 C.D. 160, 162, 45 App. D.C. 298 (1916) and the policy of according priority to the inventor having the earliest conception date, *Marconi Wireless Co.* v. *United States,* 320 U.S. 1, 34 (1943), *Fearon* v. *Krasnow,* 172 F. 2d 233, 237 (CCPA 1949) will both be served by awarding priority to Cricchi.

CONCLUSION

Petitioner prays for a rehearing of the instant cause for the purpose of permitting this Court to revise its opinion in conformance with the decision of the Board of Patent Interferences.

Respectfully submitted,

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APPENDIX B

APPELLANTS' OPPOSITION TO PETITION FOR REHEARING

Introduction—Cricchi Belatedly Tries Another Approach To His Discredited Record

Cricchi is really not petitioning for rehearing. Now that his initial approach has failed, Cricchi is improperly asking this Court to hear a different approach, but one still based on his already-discredited record.

Cricchi's previous approach was based primarily on time charge records — a tacit admission that other documents and testimony failed to establish reasonable diligence. Now he presumes that the Court has overlooked his other documents and exhibits and belatedly argues that they establish reasonable diligence independent of the time charge records. But even this argument is addressed solely to the October 1970 to September 1971 period and ignores the fact that there is a total void of any evidence of any specific acts at specific times during the initial four months of the critical period.

Moreover, Cricchi's new facade, based on an itemization of alleged specific acts at specific times (P2-5), is as misleading as the discredited facade created from the time charge records. He includes still other work on matters not involving a reduction to practice of the invention. He alleges dates and activities contrary to the record.

Cricchi concludes with a recitation of ten new "controlling authorities" going back to as early as 1916. He admits that *none* of these "authorities were cited in the

Decision or *in the briefs* before this Court" (P8). From these authorities he erroneously distills a self-serving "*subjective*" standard for determining reasonable diligence. This is an attempt to sell the notion that he should be permitted to withdraw four months of time from his six-year reservoir of "reasonable diligence" created from an R&D program of general applicability and credit the four months toward diligence in this case.

Clearly it is Cricchi, not the Court, who has overlooked and misapprehended the law and the facts. Cricchi's petition should be denied.

Cricchi's Latest Approach Overlooks A Glaring Void In His Record

Cricchi's latest approach, based on a contention that diligence is shown independently of time cards and Cricchi's testimony relating thereto (P1), recognizes that the time record evidence has no probative value. Thus, Cricchi has effectively removed the last vestige of any evidence relating to activity during the first four months of the critical period (June-October 1970).

Excluding the time records and his October 1969 conception document (CX12), Cricchi's next exhibit, chronologically, is CX13, dated October 9, 1970, four months *after* Naber et al.'s entry into the field (June 1970). Neither Cricchi nor any of his witnesses testified as to any specific acts at specific times during the June-October 1970 period.* Thus, the totality of evidence on behalf

* In his petition (P11), Cricchi refers to certain "steps taken . . . *between June and October of 1970*", *e.g.*, "building and testing relatively inexpensive 'very simple capacitor structures' (R373)", etc. Cricchi's supporting record references (P11), however, do not support the contention that these steps were in fact carried out "between June and October of 1970".

of Cricchi during the first four months adds up to zero, *i.e.*, no documents, no physical exhibits and no oral testimony establishing exactly what was done, when it was done or who did it.

In his petition, Cricchi erroneously assumes that the only issue as to this four-month period is whether the R&D program to optimize layer deposition techniques of general MNOS applicability can properly be counted as part of his diligence. To rely on such R&D program during this four-month period, however, Cricchi has the affirmative burden of establishing that at least the R&D work was being carried out with reasonable diligence during that period. On this point the record is devoid of evidence; there is only attorney argument. On this ground alone, Cricchi's petition for rehearing should be denied.

Cricchi's Itemization Of Activity Confirms Lack Of Diligence

In his previous presentations Cricchi created a facade of reasonable diligence from time cards (CX100) and his misleading charts thereof (R1015, 1017).* Now that his time records have been rejected (D10-12), he seeks rehearing on the basis of a hodgepodge itemization of alleged specific acts at specific times (P2-5) which he mischaracterizes as "a massive and well-corroborated record of diligence" (P1).

Initially, it should be noted that the first and earliest item set forth in his itemization is dated "10/23/70" (P2). *This is four months too late!* The critical period started in June, 1970.

* A composite of Cricchi's misleading charts of the time records (R1015, 1017) was reproduced on a 40"x40" board and employed as a visual aid at oral argument by Naber et al.

Cricchi's itemization confirms that the Court did not misapprehend his old facade — the time records. Although more time of Ruehling than that of anyone else was included in the alleged activity on the 834 device from late October 1970 to early May 1971, the Court correctly noted that,

> ". . . he [Ruehling] did not begin working on the '834 device' . . . until May 1971. . ." (D11)

Cricchi's itemization confirms the Court's observation. Ruehling's first appearance occurs under the date entry of "5/5/71-5/11/71" (P3).

In his previous presentations, including oral argument, Cricchi never challenged Naber et al.'s repeated contentions that there were gaps in his proofs (*e.g.*, R1089, 1104, 1109; NBr33, 45-46; NRBr1). He simply papered them over with his time charge records. Even now he does not address the exemplary gaps set forth in Naber et al.'s brief (NBr45-46). But even in attempting to undo the past, his resort to a hodgepodge itemization of events falls far short of covering the gaps.

Hodgepodge Itemization Includes Work On Other Matters

While space limitations do not permit a detailed analysis of dates and events itemized by Cricchi, Naber et al. emphasize that careful scrutiny of Cricchi's itemization reveals that it is no less a misrepresentation of reasonable diligence than the misleading time cards. For example, Cricchi's itemization includes, *inter alia*, much work on things other than devices corresponding to the counts, such as the extensive early work on the metering subsystem breadboard (*e.g.*, P2-3, items dated "11/30/70-4/21/71", "3/1/71", "5/12/71-5/13/71", "5/14/71", etc.).

The metering subsystem breadboard was an apparatus having a nonvolatile memory portion. The early version of the metering subsystem breadboard built shortly after March 1st, 1971 did *not* employ a device of the counts (CX24). In late June of 1971 or early July of 1971, the breadboard was *rewired* to accommodate for the first time the 834 chip incorporating devices of the counts (CX24, 53, R250, 276, 290, 294, 309-311). Yet, all of the work on the breadboard prior to late June 1971 is improperly included in Cricchi's itemization of activity.

Hodgepodge Itemization Alleges Misleading Dates And Activity

Many of the dates alleged in Cricchi's itemization are misleading or contrary to his record. For example, Cricchi alleges:

> "3/29/71 Cricchi completed Electrical Test Specification for Metering Subsystem (CX40)." (P3)

The record reveals, however, that CX40 was prepared and dated "March 29, 19**72**", not "3/29/**71**" (CX40, R240-242, 427).

As another example, Cricchi alleges:

> "5/28/71 Cricchi performed tests on 834 memory array (CX59)." (P3)

The record reveals, however, that Cricchi's work was carried out two months later and that the portion of CX59 representing work by Cricchi is dated **7**/28/71, not "**5**/28/71" (CX59, R255-258, 299-301). Moreover, all of the tests shown in CX59 were performed on test capacitor structures, *not* the 834 memory array itself (R300, 313).

Cricchi's Legal Argument Rests On A Discredited Factual Premise

Implicit in Cricchi's strained attempt to find legal support for including the R&D work on layer deposition techniques during the first four months is a factual premise already discredited herein, namely, that such work was phase one of an integral two-phase program to reduce the invention to practice. It was admitted by Cricchi at the oral argument, however, that the "two-phase" argument was solely "attorney argument" without support in contemporaneous evidence. Thus, Cricchi's legal argument is irrelevant to the actual fact situation herein.

The few of Cricchi's new "controlling authorities" which relate specifically to the issue of diligence involved activity which was an integral part of an effort to reduce the particular invention to practice, actually or constructively. In contrast, there is no contemporaneous evidence that the Westinghouse R&D work on which Cricchi seeks to rely was tied to, or an integral part of, a reduction to practice of the device of the counts.

More specifically, the R&D work was started long before conception and continued long after reduction to practice (R226, 305-306, 374). The work was applicable to any MNOS device (R531). There is no contemporaneous evidence that the continuation of the R&D work during the initial four months of the critical period was specifically for the purpose of providing advanced technology for the reduction to practice. There is no contemporaneous evidence of an express intention during the initial four months to reduce the invention to practice as soon as particular technology goals were achieved by the R&D work. There is no contemporaneous

evidence of the status of the R&D process development program in June 1970, the beginning of the critical period. There is no contemporaneous evidence establishing what R&D results were in fact achieved by October 1970 which could be related to the belated decision to commence the attempt to reduce the invention to practice. To the contrary, the belated decision was apparently made when a commercial need arose (NBr11-13). Thus, Cricchi's new precedents are wholly inapplicable and do nothing to justify Cricchi's attempt to withdraw four months of R&D activity from a six-year reservoir thereof.

The lack of space precludes a specific discussion of each precedent; the lack of pertinence makes it unnecessary. Suffice it to contrast the Cricchi fact situation with that in the most recent case relied upon by Cricchi, *i.e.*, *Bell Telephone Laboratories, Inc.* v. *Hughes Aircraft Co.*, 191 USPQ 23 (D.Del. 1976), affirmed 195 USPQ 695 (3 Cir. 1977), which involves related technology (P8, 11). In *Bell*, the counts were to a *process* for making a semiconductor device, not the device itself. The inventors commenced actually reducing the invention to practice immediately after conception. They constructed the device by the claimed process but encountered certain problems in so doing. They then directed their attention to solving these problems and the Court found that these efforts constituted part of Bell's reasonable diligence. It was a unitary, integral program from start to finish, all directed to reducing the particular process invention of the counts to practice.

Cricchi's situation, however, represents an after-the-fact attempt to palm off an early portion of an R&D process development program of general MNOS applicability as an integral part of a later effort to reduce a particular

invention to practice. The R&D program could not have been part of an integral program to reduce Cricchi's invention to practice. It was started almost a year before conception (R225-227, 341-342, 487).

Cricchi's Subjective Standard For Determining Diligence Is Fraught With Problems And Uncertainty

Cricchi argues,

> ". . . **Subjective** judgment being crucial for a successful reduction to practice, it must be even more crucial and removed from second guessing in the selection of the path toward reduction to practice. . . ." (P6)

He argues in effect that so long as he is dissatisfied with the attainable performance capabilities or so long as he has set performance goals which he personally can not achieve regardless of whether others could, he is excused from reducing a device to practice. He then seeks to credit toward diligence any work thereafter which may decrease his personal dissatisfaction or may directly or incidentally enhance the possibility of achieving the performance capabilities he has set, even though such work may not involve reducing the invention to practice.

Such subjective standard is not the law of reasonable diligence and would create many problems and injustices.* A subjective approach was rejected in *Hudson* v. *Giuffrida*, 328 F.2d 918, 140 USPQ 569 (CCPA 1964). Hudson delayed testing an improvement on the subjective ground that his supervisor would not have been satisfied with the test means then available. Even though the delay was

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* See NBr 30-32 re inherent dichotomies, inconsistencies and double standards.

less than a month, the Court rejected Hudson's subjective justification for the delay, stating (328 F.2d 925):

> ". . . We do not consider as germane to the issue of diligence that such tests would have been *more* significant later on." (Emphasis in original)

In the present controversy, the work on layer deposition techniques started in early 1969, long before Cricchi's conception, and was continuing at least as late as 1975. Cricchi's argument inevitably provides him with the unwarranted six-year reservoir of "reasonable diligence", not only as to the device of the counts but also as to any other MNOS device Westinghouse had under development. Cricchi's record establishes that Westinghouse did in fact have other MNOS devices under development (*e.g.*, CX12, 73). Cricchi could foreclose the field and create injustice just by setting far-reaching, unrealistic goals or being personally dissatisfied over a long period of time.

As to considering "the inventor's objectives" (P9), Naber et al. agree that it is appropriate to consider those set forth in the counts or disclosures of the parties. Here the objectives set forth in both disclosures are essentially the same and are achieved by simply building the structure of the counts.

Cricchi repeats what he has incorrectly argued throughout these proceedings, that the R&D program was required to solve the problem of degradation under continual read/write cycling (P9, 10), a problem *not* reflected in the counts or disclosures. But even this argument overlooks the undisputed fact, established by Cricchi's own record (*e.g.*, CX73, R267-268, 351), that the structure of the device of the counts, not the layer deposition

R&D work, is the primary solution to this problem. Cricchi so admitted (*e.g.*, R1010, 1196, CBr3-4). This design goal of Cricchi was realized when the structure of the counts was belatedly built. If Cricchi had still other goals in mind, not reflected in the counts or the disclosures and not required for a reduction to practice, such subjective thoughts hardly excuse his failure to act promptly to solve the problem of degradation.

Pushed to its limit, Cricchi's subjective standard of diligence would encompass personal goals or objectives hidden in the recesses of an inventor's mind. How could diligence ever be rationally determined under such a standard?

In attempting to denigrate Westinghouse's own capabilities of building MNOS memory devices and justify his own delay in reducing his invention to practice, Cricchi suggests that the Court misconstrued the proposal to the Air Force and that such proposal did *not* indicate that an early Westinghouse device had "a nonvolatile memory, *i.e.*, retention of memory when power is removed from the device" (P9). Cricchi overlooks the fact that according to the proposal the particular device had already been developed and was described and labelled therein as "A Four-Stage Counter *With Nonvolatile MNOS Memory*" (CX12, R905 including footnote 8). In fact, Cricchi represented to the PTO in other patents (R1129-1155) filed June 24, 1970, coincident with the beginning of the critical period, that his MNOS memory transistors have nonvolatile (power-off) memory retentivity **"for substantially indefinite periods of time"** (e.g., R1136, Col. 3, lines 44-50).

Conclusion

Nowhere in his petition has Cricchi demonstrated any substantial reason or basis for granting rehearing. Moreover, this is a dispute involving solely the private interests of the litigants and there are no questions of general public interest or fundamental questions of law which otherwise justify a rehearing. Cricchi's petition should therefore be denied.

Respectfully submitted,

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